東京帝國大學理學部紀要

第三類　植物學

第四冊　第六篇

JOURNAL

OF THE

FACULTY OF SCIENCE

IMPERIAL UNIVERSITY OF TOKYO

SECTION III BOTANY

Vol. IV Part 6

TOKYO

Published by the University

July 25, 1936

The "JOURNAL OF THE FACULTY OF SCIENCE" is the continuation of the "JOURNAL OF THE COLLEGE OF SCIENCE" published by this University in forty-five volumes (1887–1925), and is issued in five sections:

Section I.—Mathematics, Astronomy, Physics, Chemistry
Section II.—Geology, Mineralogy, Geography, Seismology
Section III.—Botany
Section IV.—Zoology
Section V.—Anthropology

All communications relating to this JOURNAL should be addressed to the DEAN OF THE FACULTY OF SCIENCE, IMPERIAL UNIVERSITY OF TOKYO.

Bœhmeria Japonica

auctore

Yosisuke SATAKE

With 54 Text-figures

The species of *Bœhmeria* are mostly indigenous to Asia, especially to the temperate and tropical zones. About eighteen species and three varieties were hitherto known from the Japanese Empire. Recently, the writer, finding great interest in this group, studied it under the supervision of Professor T. NAKAI, as the result of which the number of Japanese *Bœhmeria* has, by the addition of nineteen species, two varieties, and four forms, been increased to fourty species, five varieties, and four forms.

The writer will first divide the genus into two subgenera, the *Tilocnide* and *Duretia*, based on alternate and opposite leaves. The latter is subdivided into three groups according to the mode of hairs on the achenes; the first group having uniformly pubescent achenes, and the second almost glabrous but with a little adpressed pilose at the apices (Fig. 1-D), while the third is densely hispid at the apices (Fig. 1-E).

The first group is further divided into three divisions by the shape of the achenes and inflorescences. The first division, which has ellipsoid achenes with long cuneate base and long tubular apex (Fig. 1-A), is represented by Sect. *Densiflorœ;* the second has compressed turbinate achenes bearing a cuneate base, and a round but not tubular apex (Fig. 1-B), and represented by Sect. *Spicatœ;* the last has ellipsoid achenes bearing a short base and long tubular apex (Fig. 1-C), and represented by Sect. *Zollingerianœ*. In the former two sections the female and male inflorescences are both spicate and axillary, but in the *Zollingerianœ* the female are paniculate and terminal, although the male are capitate and axillary.

The second group is represented only by the Sect. *Sieboldianœ*.

The third group is represented by three sections, *Splitgerbera, Pannosœ*, and *Longispicœ*, discrimination of these sections being based mainly on the characters of the serrations, female spikes, and achenes. In *Splitgerbera*, the

leaf has equally crenate, crenato-dentate, or crenulate margins, while the mature female spikes are thick cylindrical or sometimes condensed, and the achenes are oblanceolate or long turbinate with long cuneate base. *Pannosæ* is close

Fig. 1. Five types of achenes of Japanese species of *Bœhmeria*, diagrammatically drawn. A, *B. boninensis*; B, *B. spicata*; C. *B. Zollingeriana*; D, *B. Sieboldiana*; E, *B. longispica*. ×ca. 13.

to *Splitgerbera*, but the leaf has larger crenations and the achenes are obovoid with obtuse or somewhat cuneate base. In *Longispicæ*, the leaf has unequally or irregularly serrate margins, and sometimes double serrations, or rarely, tricuspis at the apex.

Discriminations of species and varieties under the same sections are usually based on the shape, hairs, serrations, and texture of the leaves.

In the subgenus *Tilocnide* having alternate leaves, the female and male inflorescences are the compound panicle and always axillary, while in the subgenus *Duretia*, the female and male are always axillary and spike, sometimes paniculate, with however the exception of Sect. *Zollingerianæ*, in which the female are panicle and terminal, but the male are head and axillary. The inflorescences are, however, not so important in classifying the species.

The writer has investigated the structure of the petioles, especially the presence of medullary bundles and bast fibres therein to ascertain what importance they serve for classification, or, what constant anatomical characteristics are found in each species. Fresh material of the following nineteen species and one variety were used for this purpose: *Bœhmeria utilis*, *B. nivea*, *B. frutescens*, *B. boninensis*, *B. tricuspis*, *B. spicata*, *B. paraspicata*, *B. Sieboldiana*, *B. egregia*, *B. biloba*, *B. arenicola*, *B. kiyozumensis*, *B. præstabilis*, *B. tiliifolia*, *B. minor*, *B. platanifolia*, *B. longispica*, *B. robusta*, *B. pachystachya*, *B. tenuifolia* var. *nigricans*. Although the material was insufficient for the studies

desired, the writer found it possible to systematize the genus roughly according to the anatomy of the petioles.

Structure of petioles. Observations were made on cross sections of the middle part of the petioles. The outermost is a layer of epidermis consisting of small elliptical epidermal cells (the largest less than 0.025 mm. diam.) with uniformly and somewhat thickened cell-walls (Fig. 2-e). Inside the epidermis are several layers of collenchyma (Fig. 2-c). The width of this tissue, and the dimensions of the collenchymatous cells, or the degree of thickening, vary with species, hence of no use in taxonomy. The cortex, which is inside the collenchyma, consists of large and polygonal parenchymatous cells with chlorophyll grains and thin cell-walls (the largest 0.1 mm. diam.), the intercellular spaces being remarkably well developed (Fig. 2-d). Clustered crystals of calcium oxalate are scattered here and there as in the phlœm (Fig. 2-k).

There are two different ways in which the cortex correlates with the collenchyma, namely, (1) the collenchyma perfectly covers the inner cortex, so that the latter cannot communicate with the epidermis, as seen in *B. spicata, B. Sieboldiana, B. biloba, B. platanifolia, B. longispica* etc. belonging to the subgenus *Duretia;* and (2) the collenchyma almost covers the inner cortex, but generally in four spots (two on the upper surface and two on the lateral sides) falling into narrow gaps, so that the

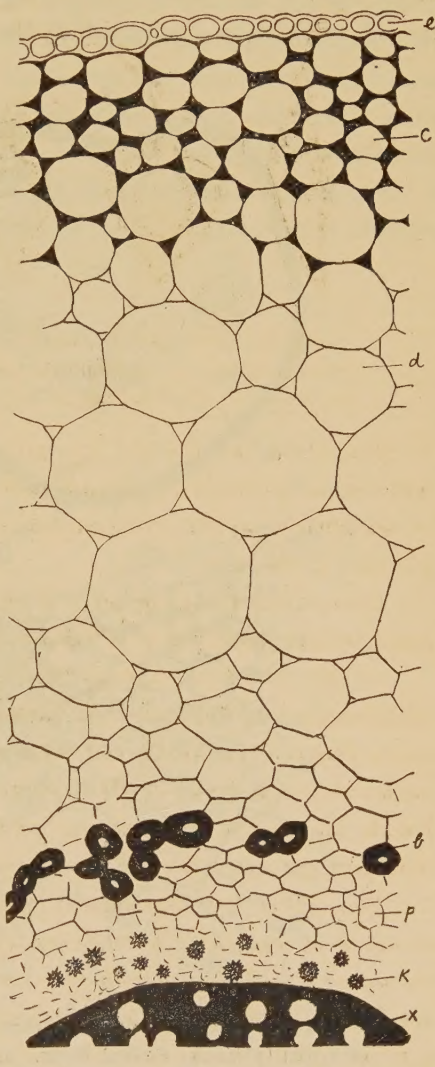

Fig. 2. Cross section of a petiole of *Bœhmeria platanifolia.* e, epidermis; c, collenchyma; d, parenchyma; b, bast fibres; p, phloem parenchyma; k, clustered crystals of calcium oxalate; x, xylem. ×175.

cortex opens into the epidermis through the gaps (Fig. 3-g), as in *B. utilis*, *B. nivea* and *B. frutescens* belonging to the subgenus *Tilocnide*. In living material one can usually see four green lines on the petioles, two of which are along the upper groove and two along the lateral sides. These lines correspond to the gaps of the collenchyma. This remarkable anatomical characteristic is the only criterion for distinguishing the two subgenera, *Duretia* and *Tilocnide*.

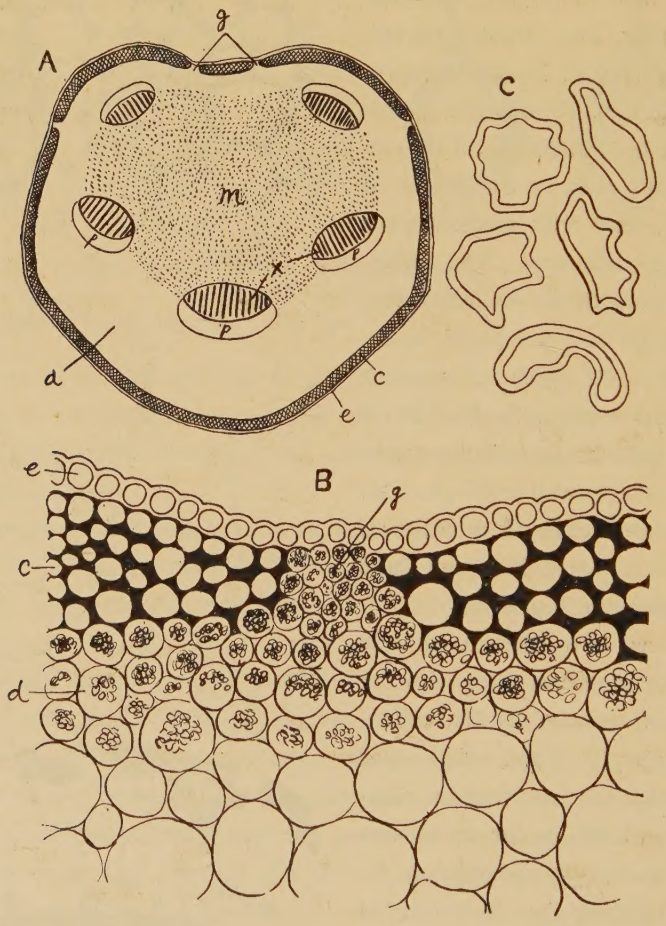

Fig. 3. *Bœhmeria utilis*. A, cross section of a petiole; B, magnified view of a part (g) of A; C, bast fibres. e, epidermis; c, collenchyma; d, parenchyma; p, phloem; x, xylem; m, pith; g, gap of collenchyma. A = × 16, B, C = × ca. 233.

Inside the cortex five (or seven) vascular bundles are found in a circle, three of them situated at the lower and two (or four) at the upper side, each

having the xylem inwards and the phloem outwards (Fig. 4). In the phloem parenchyma of all species a large number of clustered crystals of calcium oxalate is always present. In *Bœhmeria utilis, B. platanifolia, B. Sieboldiana,* and *B. longispica,* bast fibres are abundantly found in the phloem parenchyma, but only a few in *B. tricuspis, B. kiyozumensis, B. tiliifolia. B. robusta,* and *B. spicata,* while in *B. minor, B. biloba, B. arenicola, B. nivea,* and *B. frutescens,* they are not visible. The fibres are of two kinds; the one with bast fibres having thined and sulcate cell-walls, 0.15–0.2 mm. round, as is seen only in *B. utilis,* and the other having very thickened and non-sulcate cell-walls, 0.06–0.08 mm. round, as seen in *B. Sieboldiana, B. tricuspis, B. platanifolia, B. longispica, B. præstabilis* etc. The reason why the Ramie (*B. utilis*) is so useful, is probably

Fig. 4. Cross sections of petioles showing the shapes and distributions of the vascular bundles, medullary bundles (m) and bast fibres (b). A, *B. tricuspis;* B, *B. pachystachya;* C, *B. robusta;* D, *B. longispica;* E, *B. platanifolia;* F, *B. spicata;* G, *B. Sieboldiana;* H, *B. tiliifolia;* I, *B. boninensis;* J, *B. minor;* K, *B. tenuifolia* var. *nigricans;* L, *B. kiyozumensis;* M, *B. biloba;* N, *B. præstabilis;* O, *B. egregia;* P, *B. arenicola.* ×6.

because of its thick bast fibres with very thined cell-walls. The pith in the centre consists of large and polygonal parenchymatous cells.

Sometimes, two medullary bundles are found in the pith near the lower three vascular bundles (Fig. 4-m). These are seen in *B. biloba, B. arenicola, B. kiyozumensis, B. præstabilis, B. egregia* and *B. tenuifolia* var. *nigricans*, while none can be seen in *B. minor, B. boninensis, B. robusta, B. tiliifolia, B. spicata, B. longispica, B. Sieboldiana, B. platanifolia, B. tricuspis, B. pachystachya.*

From the foregoing anatomical characters of petioles, the species observed here can be distinguished as follows:

1. Collenchyma almost covers the cortex, but falls in small gaps at four (or five to six) spots, the cortex then opening into the epidermis through the gaps ..... Subgenus **Tilocnide**
   2. Bast fibres present (abundant)..... *B. utilis*
   2. Bast fibres absent ..... *B. nivea*
      B. frutescens

1. Collenchyma perfectly covers the inner cortex; the latter never communicates with the epidermis ..... Subgenus **Duretia**
   2. Two medullary bundles present.
      3. Bast fibres absent.
         4. Petiole 4 mm. wide with somewhat deep groove. Cross section somewhat compressed pentagonal ..... *B. biloba*
         4. Petiole 5–6 mm. wide with somewhat deep groove. Cross section somewhat roundish pentagonal..... *B. arenicola*
      3. Bast fibres scarcely present.
         4. Petiole 4 mm. wide with shallow and broad groove. Cross section somewhat pentagonal ..... *B. egregia*
         4. Petiole 3 mm. wide with somewhat shallow groove. Cross section somewhat roundish pentagonal ..... *B. kiyozumensis*
      3. Abundant bast fibres.
         4. Petiole 5 mm. wide with seven leaf traces..... *B. præstabilis*
         4. Petiole 3 mm. wide with five leaf traces .....
            ..... *B. tenuifolia* var. *nigricans*
   2. Medullary bundles absent.
      3. Bast fibres absent.
         4. Petiole 2.5 mm. wide with somewhat deep groove. Cross section somewhat pentagonal..... *B. minor*

4. Petiole 5 mm. wide with groove not so deep. Cross section compressed pentagonal ..... *B. boninensis*

3. Bast fibres scarcely present.
   4. Petiole 4 mm. wide with shallowest groove. Cross section broad-elliptic ..... *B. robusta*
   4. Petiole with deep groove. Cross section somewhat pentagonal
      5. Petiole 3 mm. wide. Section of groove cuneate ... *B. tiliifolia*
      5. Petiole 2 mm. wide. Section of groove oblong ... *B. spicata*

3. Abundant bast fibres.
   4. Petiole 5 mm. wide with small groove. Cross section nearly circular ..... *B. longispica*
   4. Petiole under 3 mm. wide with somewhat deep or shallow groove. Cross section somewhat pentagonal or roundish quadrate.
      5. Petiole with somewhat deep groove and five leaf traces ..... *B. Sieboldiana*
      5. Petiole with very shallow groove and seven leaf traces
         6. Cross section somewhat pentagonal .. *B. platanifolia*
         6. Cross section somewhat roundish quadrate ..... *B. tricuspis*
            B. pachystachya

The writer takes this opportunity of expressing his great indebtedness to Professor T. NAKAI, under whose kind guidance this work was accomplished. He is also indebted to Assistant Professor M. HONDA who gave him much advice. To Messrs K. HISAUCHI, Y. MOMIYAMA, F. MAEKAWA, and Y. JÔTANI, who kindly placed their valuable specimens at his disposal, the writer makes grateful acknowledgment of the courtesy.

Bœhmeria JACQUIN

JACQUIN, Enum. System. Pl. Ins. Carib. p. 9 (1760) et Stirp. Amer. Hist. p. 216 (1763)—BLUME in Mus. Bot. Lugd.-Bat. II. p. 194 (1856)—WEDDELL in Arch. Mus. d'Hist. Nat. IX. Liv. III. p. 343 (1856) et in DC. Prodr, XVI.-1, p. 195 (1869)—BENTHAM & HOOKER, Gen. Pl. III. p. 387 (1883)—DETORRE & HARMS, Gen. Siphonogam. p. 124 (1900–1907).

Duretia GAUDICHAUD in Bot. Voy. Freycin. p. 499 (1826).

Splitgerbera MIQUEL, Comm. Phytogr. III. p. 133 (1840).

Ramium RUMPHIUS apud O. KUNTZE, Rev. Gen. Pl. II. p. 631 (1891).

Clavis subgenerum

Folia alterna, laminis subtus niveo-tomentosis rarius glabratis. Florum glomeruli laxe paniculati ..... Subgen. I. **Tilocnide**

Folia opposita rarius subopposita, laminis subtus non niveo-tomentosis sed pubescentibus vel holosericeis rarius subglabris. Flores in glomerulos spicatos vel paniculatos digesti rarius in foliorum axilis glomerati .... Subgen. II. **Duretia**

Subgen. I. **Tilocnide** (BLUME) SATAKE.

Bœhmeria Sect. *Tilocnide* BLUME in Mus. Bot. Lugd.-Bat. II. p. 210 (1856). Folia alterna, laminis subtus semper niveo-tomentosis rarius glabratis. Flores masculi et feminei in glomerulos paniculatos digesti. Perigonium fructiferum lenticulari-ellipsoideum margine non complanatum basi pubescens apice villosum breve tubulatum.

Clavis specierum et varietatum

1. Rami petiolique dense canescenti-hispidi. Laminæ foliorum subtus niveo-tomentosæ præsertim in nervis canescenti-hirsutæ.
   2. Laminæ foliorum basi cuneatæ petiolis breviores ..... 1) *B. utilis*
   2. Laminæ foliorum basi rotundatæ vel subcuneato-cordatæ petiolis longiores ..... 2) *B. nivea*
1. Rami petiolique pubescentes. Laminæ foliorum subtus niveo-tomentosæ vel glabratæ, rarius lanatæ.
   2. Laminæ foliorum subtus niveo-tomentosæ ..... 3) *B. frutescens*
   2. Laminæ foliorum subtus glabratæ virides .... 3-a) *B. frutescens* var. *concolor*
   2. Laminæ foliorum subtus lanatæ viridulæ .... 3-b) *B. frutescens* var. *viridula*

1) **Bœhmeria utilis** BLUME (Fig. 5; Fig. 6-A) in Ind. By. I. p. 483 (1853)—ANDRÉ in Rev. Hort. LXII. p. 184 (1890).

Bœhmeria nivea var. *candicans* WEDDELL in DC. Prodr. XVI.-1, p. 207 (1869)—YAMAMOTO, Suppl. Icon. Pl. Formos. I. p. 20 (1925)—MAKINO & NEMOTO, Fl. Jap. p. 1063 (1925) et ed. 2. p. 223 (1931).

Nom. Jap. *Rami.*

Hab. Widely cultivated. In Formosa it is sometimes found wild.

Distr. China, the Philippines, the Malay Peninsula and Java.

2) **Bœhmeria nivea** GAUDICHAUD (Fig. 5; Fig. 6-B) in Bot. Voy. Freycin. p. 499 (1826) — HOOKER & ARNOTT, Bot. Beech. Voy. p. 214 (1841) — MIQUEL, Fl. Ind. Bat. I.-2, p. 253 (1859) et in Ann. Mus. Lugd.-Bat. III. p. 131 (1867) — BLUME, Mus. Bot. Lugd.-Bat. II. p. 210 (1856) — WEDDELL, Monogr. Fam. Urt.

Fig. 5. *Bœhmeria utilis* BLUME (left) and *B. nivea* GAUDICHAUD (right), specimens taken from the cultivated plants in the Botanic Garden of the Imperial University of Tokyo at Koisikawa, Tokyo. ×$\frac{1}{6}$.

p. 380, t. 11, f. 10–17 (1856) et in DC. Prodr. XVI.-1, p. 206 (1869) — BENTHAM, Fl. Hongkong. p. 331 (1861) — C. H. WRIGHT in Journ. Linn. Soc. XXVI. p. 486 (1899) — KOORDERS, Exkurs. Fl. Jav. II. p. 143 (1912) — SCHNEIDER in SARGENT, Pl. Wilson. III. Pt. 2, p. 312 (1916) — GAGNEPAIN in Lecomte, Fl. Gén. L'Indo-Chine, V. p. 845 (1929) — MERRILL, Enum. Philip. Fl. Pl. II.-1, p. 90 (1923) et in Trans. Amer. Phil. Soc. XXIV. pt. II. p. 139 (1935).

Urtica nivea LINNÆUS, Sp. Pl. p. 1398 (1753) — THUNBERG, Fl. Jap. p. 71 (1784) — WILLDENOW, Sp. Pl. IV. p. 366 (1805).

Ramium niveum O. KUNTZE, Rev. Gen. Pl. II. p. 632 (1891).

Nom. Jap. *Nanban-karamusi* (nov.).

Hab. *Honsyû:* Prov. Izu: Ins. Hatizyô (J. MATSUMURA, Mai. 9, 1887). *Sikoku:* Prov. Iyo: Utimimura (T. NAKAI, Jun. 9, 1927). *Korea:* Ins. Uturyôto:

Tûdô (T. ISHIDOYA, Mai. 28, 1916, no. 158) — Taikadô (T. NAKAI, Jun. 16, 1917, no. 4244); Ins. Hiyôtô circa Quelpært (T. NAKAI, Jun. 22, 1913).

Distr. China, the Philippines, Indo-China, and the Malay Peninsula.

This plant, commonly cultivated in Japan, sometimes grows wild.

forma **grosseserrata** SATAKE, f. nov.

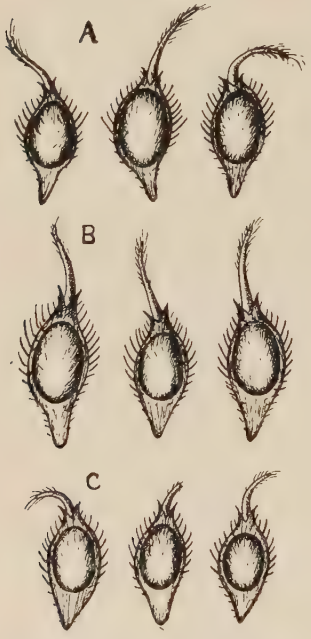

Fig. 6. Achenes of *Bœhmeria utilis* (A), *B. nivea* (B) and *B. frutescens* THUNBERG (C). ×ca. 13.

Caulis erectus superne dense canescenti-hispidus inferne glabrescens usque 4 mm. in medio diametro. Folia alterna; laminis ovatis usque 9–12 cm. longis 7–9 cm. latis, apice acuto-acuminatis basi truncato-cuneatis vel subcordatis, supra glabriusculis subtus niveo-tomentosis præsertim in nervis canescenti-hirsutis, margine irregulariter arguto-serratis, serris superioribus majoribus; petiolis 5–8 cm. longis dense vel sparse canescenti-hirsutis. Flores ignoti.

Nom. Jap. *Nohara-karamusi* (nov.)

Hab. *Honsyû:* Prov. Bittyû: Takamatumura (J. NIKAI, Sept. 5, 1902, no. 1066-typus); Prov. Musasi: Sakai (F. MAEKAWA, Jun. 7, 1931).

Distr. Endemica.

3) **Bœhmeria frutescens** THUNBERG (Fig. 6-C) in Trans. Linn. Soc. II. p. 339 (1794) — WILLDENOW, Sp. Pl. IV. p. 343 (1805) — PERSOON, Syn. Pl. II. p. 556 (1807) — WEDDELL, Monogr. Fam. Urt. p. 384 (1856) — NAKAI in Bot. Mag. Tokyo, XLI. p. 513 (1927) — HANDEL-MAZZETTI, Symb. Sin. VII. p. 151 (1929) — MAKINO & NEMOTO, Fl. Jap. ed. 2, p. 222 (1931).

Urtica frutescens THUNBERG, Fl. Jap. p. 70 (1784).

Bœhmeria nivea (non GAUDICHAUD) SIEBOLD & ZUCCARINI in Abh. Müench. Akad. IV. Abt. 3, p. 214 (1846) — BLUME, Mus. Bot. Lugd.-Bat. II. p. 210 (1856) pro parte — MIQUEL in Ann. Mus. Bot. Lugd. Bat. III. p. 131 (1867) — FRANCHET & SAVATIER, Enum. Pl. Jap. I. p. 439 (1875) — MAXIMOWICZ in Mél. Biol. IX. p. 639 (1876) — MATSUMURA & HAYATA, Enum. Pl. Formos. p. 385 (1906) — MATSUMURA, Ind. Pl. Jap. II.–2, p. 42 (1912) — MAKINO, IINUMA's Somoku Dzusetsu, IV. p. 1270, Pl. 1159 (1912) — YAMAMOTO, Suppl. Icon. Pl. Formos. I. p. 20 (1925) — MAKINO & NEMOTO, Fl. Jap. p.

1063 (1925) — MASAMUNE in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 158 (1934).

Bœhmeria frutescens var. *concolor* (non NAKAI) SASAKI, Catal. Govern. Herb. p. 177 (1930).

Nom. Jap. *Mao, Karamusi.*

Hab. *Honsyû:* Prov. Musasi: Tokyo (J. MATSUMURA, Aug. 1878); Prov. Izu: Yugasima (J. MATSUMURA, Jun. 14, 1883); Prov. Suô: Ôutimura (J. NIKAI, Sept. 4, 1892, no. 705); Prov. Kawati (T. TADA, Aug. 1899); Prov. Sagami: Yamakita (S. HATTORI, Oct. 1922); Prov. Tôtômi: Mt. Akiha (Y. SATAKE, Aug. 29, 1935); Prov. Izu: Simoda (Y. SATAKE, Sept. 4, 1935). *Sikoku:* Prov. Tosa: Mt. Yahazuyama (J. MATSUMURA, Aug. 18, 1888); Prov. Awa: Kamomyômura (J. NIKAI, Sept. 28, 1904, no. 1518). *Kyûsyû:* Prov. Higo (ex K. MAYEBARA). *Korea:* Ins. Quelpaert (T. NAKAI, Mai. 9, 1913, no. 1041 — Jun. 6, 1913 — Oct. 28, 1917, no. 6157 — Nov. 3, 1917, no. 6158); Ins. Daikokusan: Mt. Mongan (T. ISHIDOYA, Aug. 25, 1919, no. 3455). *Formosa:* Tanawsoan (ÔWATARI, Sept. 15, 1896); Kôtôsyo (K. MIYABE, Nov. 25, 1899); Agincort (T. KAWAKAMI, 1904).

Distr. China.

3-a) Bœhmeria frutescens var. **concolor** NAKAI in Bot. Mag. Tokyo, XLI. p. 514 (1927) — MAKINO & NEMOTO, Fl. Jap. ed. 2, p. 223 (1931).

Bœhmeria nivea var. *viridis* MAKINO in Bot. Mag. Tokyo, XI. p. 316 (1897) et IINUMA's Somoku Dzusetsu IV. p. 1271, Pl. 1160 (1912) cum descript. Jap. — MATSUMURA, Ind. Pl. Jap. II,–2, p. 42 (1912) nom. tantum.

Bœhmeria nivea var. *concolor* MAKINO in Bot. Mag. Tokyo, XXXIII. p. 251 (1909) cum descript. Angl. — MAKINO & NEMOTO. Fl. Jap. p. 1063 (1925).

Bœhmeria frutescens var. *viridis* SASAKI, Catal. Govern. Herb. p. 177 (1930).

Nom. Jap. *Ao-karamusi, Kusa-mao.*

Hab. *Honsyû:* Prov. Sagami: Zinmuzi (K. HISAUCHI, Aug. 30, 1931). *Sikoku:* Prov. Sanuki (R. HIRAMA, Aug. 15, 1912, no. 15). *Kyûsyû:* Prov. Higo (ex MAYEBARA). *Formosa:* Kagi (T. KAWAKAMI et U. Mori, Oct. 27, 1906); Sankakuyu (Y. SHIMADA, Sept. 24, 1913, no. 3); Takao (T. SÔMA, Sept. 12, 1915).

Distr. China.

3-b) Bœhmeria frutescens var. **viridula** T. SUZUKI in Short Fl. Formos. p. 47 (1936).

Bœhmeria nivea var. *viridis* (non MAKINO) YAMAMOTO, Suppl. Icon. Pl. Formos. I. p. 20 (1925).

Bœhmeria nivea var. *viridula* YAMAMOTO in Journ. Soc. Trop. Agr. IV. p. 50 (1932).

Nom. Jap. *No-karamusi* (YAMAMOTO).

Hab. *Formosa;* Prov. Kwarenkô (ex YAMAMOTO).

Distr. Endemica.

Subgen. II. **Duretia** (GAUDICHAUD) SATAKE.

Duretia GAUDICHAUD in Bot. Voy. Freycin. p. 499 (1826) pro parte.

Bœhmeria Sect. *Duretia* BLUME in Mus. Bot. Lugd.-Bat. II. p. 212 (1856).

Folia opposita rarius subopposita, laminis subtus non niveo-tomentosis sed pubescentibus vel holosericeis rarius subglabris. Flores masculi in glomerulos spicatos vel fere paniculatos digesti rarius in foliorum axilis glomerati, feminei in glomerulos spicatos interdum paniculatos dispositi. Perigonium fructiferum obovoideum, ellipsoideum vel turbinatum, late rarius anguste complanato-marginatum, in sicco interdum in alas latas expansum, basi cuneatum vel obtusum pubescens, apice dense hispidum vel pubescens breve vel longe tubulosum.

Hoc subgenus tres sectiones habet, quæ in sequenti modo distinguendæ.

1. Perigonium fructiferum constanter pubescens.
   2. Perigonium fructiferum compresse elongato-ellipsoideum vel -oblanceolatum vel fusiformis, apice longe vel plus minus tubulatum, margine angustissime complanatum. Flores spicati axillares..... Sect 1. *Densiflorœ*
   2. Perigonium fructiferum compresse turbinato-obovoideum, apice brevissime tubulatum, late complanato-marginatum. Flores spicati axillares..... Sect. 2. *Spicatæ*
   2. Perigonium fructiferum subcompresse ellipsoideum, apice longe vel plus minus tubulatum, margine subcomplanatum. Flores masculi in foliorum axilis glomerati, feminei paniculati terminales ..... Sect. 3. *Zollingerianæ*
1. Perigonium fructiferum glabratum apice tantum adpresse puberulum ..... Sect. 4. *Sieboldianæ*
1. Perigonium fructiferum apice dense hispidum vel villosum.
   2. Laminæ foliorum margine aequaliter crenatæ, crenato-serratæ vel crenulatæ. Spicæ femineæ sæpe crassi-cylindricæ, floribus conferte glomeratis.
      3. Folia paria fere inæqualia, laminis margine æqualiter crenulatis, crenatis vel crenato-serratis. Perigonia fructifera oblanceolata vel oblongo-turbinata, basi longe cuneata ..... Sect. 5. *Splitgerbera*

3. Folia paria æqualia vel rarius inæqualia, laminis margine grosse crenatis vel crenato-serratis. Perigonia fructifera obovoidea, basi obtusa vel subcuneata ..... Sect. 6. *Pannosæ*

2. Laminæ foliorum margine inæqualiter dentato-serratæ, apice interdum grosse duplicato-serratæ rarius tricuspidatæ. Spicæ femineæ tenues elongatæ, floribus laxe vel subconferte glomeratis .... Sect. 7. *Longispicæ*

Sect. 1. **Densifloræ** SATAKE, sect. nov.

Fruticosa. Caulis ramosissimus. Folia opposita, laminis ovato- vel angusto-lanceolatis crassis supra valde strigoso-scabris subtus pubescentibus. Spicæ femineæ confertissime glomeratæ. Perigonia fructifera elongato-ellipsoidea vel fusiformia apice breve vel longe tubulosa constanter pubescentia.

Clavis specierum

1. Laminæ foliorum angusto-lanceolatæ usque 12 cm. longæ 2.5 cm. latæ. Perigonia fructifera elongato-ellipsoidea apice breve tubulata .... 4) *B. densiflora*

1. Laminæ foliorum ovato-lanceolatæ usque 12 cm. longæ 4.5 cm. latæ. Perigonia fructifera fusiformia apice longe tubulosa ..... 5) *B. boninensis*

4) **Bœhmeria densiflora** HOOKER & ARNOTT, (Fig. 7-A) Bot. Beech. Voy. p. 271 (1841) — WEDDELL in DC. Prodr. XVI.-1, p. 215 (1869) — MAXIMOWICZ in Mél. Biol. IX. p. 646 (1867) — C. H. WRIGHT in Journ. Linn. Soc. XXVI. p. 484 (1899) — MATSUMURA & HAYATA, Enum. Pl. Formos. p. 386 (1906)—ROBINSON in Philipp. Journ. Sci. Bot. VI. p. 5 (1911) — MERRILL, Enum. Philipp. Fl. Pl. II.-1, p. 90 (1923) — HANDEL-MAZZETTI, Symbol. Sin. VII. p. 151 (1929) — SASAKI, List of Pl. Formos. p. 157 (1928) et Catal. Govern. Herb. p. 177 (1930) — MAKINO & NEMOTO, Fl. Jap. p. 1062 (1925) et ed. 2, p. 222 (1931).

Bœhmeria platyphylla var. *loochooensis* WEDDELL, l. c. p. 213.

Ramium densiflorum O. KUNTZE, Rev. Gen. Pl. II. p. 633 (1891).

Nom. Jap. *Moku-mao, Yanagiba-mokumao.*

Hab. *Liukiu:* Ins. Okinawa (T. MIYAGI) — ibid. (TASHIRO, Mart. 1887); Ins. Iezima (TASHIRO, Mart. 1887). *Formosa:* Musha (B. HAYATA, Apr. 18, 1916); Keitao (B. HAYATA, Apr. 11. 1916); Hôgô (B. HAYATA, Apr. 26, 1916); Apes Hill (B. HAYATA, Apr. 21, 1917); Bokusekikaku (K. MIYABE, Dec. 10, 1899); Kelung (T. MAKINO, Sept. 2, 1896).

Distr. China and the Philippines.

5) **Bœhmeria boninensis** NAKAI (Fig. 4-I; Fig. 7-B) in Bot. Mag. Tokyo, XXXII. p. 217 (1918) — MAKINO & NEMOTO, Fl. Jap. p. 1062 (1925) et ed. 2, p. 222 (1931) — ? HOSOKAWA in Transact. Nat. Hist. Soc. Formos. XXV. p. 268 (1935).

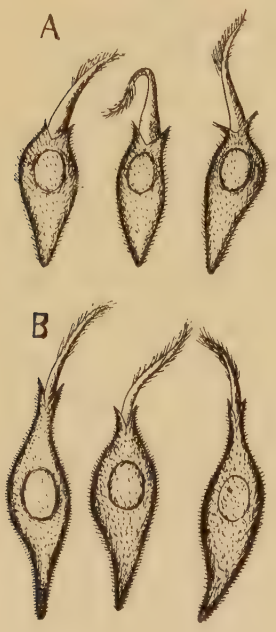

Fig. 7. Achenes of *Bœhmeria densiflora* HOOK. et ARN. (A) and *B. boninensis* NAKAI (B). ×ca. 13.

Bœhmeria densiflora (non HOOKER & ARNOTT) MAXIMOWICZ in litt. no. 37 — HATTORI in Journ. Coll. Sci. Imp. Univ. Tokyo, XXIII. Art. 10, p. 24 (1908) — MATSUMURA, Ind. Pl. Jap. II.–2, p. 41 (1912) pro parte.

Nom. Jap. *Ogasawara-mokumao.*

Hab. *Bonins:* Ins. Titizima (T. NAKAI, Jun. 29, 1920) — Renzyudani (H. HATTORI, Jul. 16, 1905) — Kiyose (T. TUYAMA, Apr. 5, 1934); Ins. Hahazima: Kitamura (T. NAKAI, Jun. 19, 1920) — ibid. (T. NAKAI, Jun. 21, 1920) — ibid. (T. TUYAMA, Apr. 13, 1934) — Tibusayama (T. TUYAMA, Apr. 13, 1934); Ins. Nisizima (T. NAKAI, Jul. 6, 1920); Ins. Otôtozima (T. NAKAI, Jul. 6, 1920). *Iwô-Islands:* Ins. Kita-iwô (T. NAKAI, Jun. 21, 1920); Ins. Naka-iwô (T. NAKAI, Jun. 24, 1920).

Distr. Micronesia (ex HOSOKAWA)?

Sect. 2. **Spicatæ** SATAKE, sect. nov.

Fruticosa vel herbacea. Caulis simplex vel ramosus. Folia opposita, pro quaque pare magnitudine et longitudine valde inæqualia vel subæqualia, laminis ovatis, ovato-lanceolatis vel rhombeo-ovatis vel -lanceolatis, apice cuspidato-caudatis rarius tricuspidatis, basi cuneatis vel obtusis rarius subrotundatis, in sicco tenuibus membranaceis vel subcoriaceis. Perigonia fructifera obovato-turbinata, late complanato-marginata, apice non tubulosa basi cuneata, constanter pubescentia.

Clavis specierum et varietatum

1. Laminæ foliorum in sicco subcoriaceæ, apice profunde tricuspidatæ... ..... 6) *B. tricuspis*

1. Laminæ foliorum in sicco membranaceæ, apice cuspidato-caudatæ.

2. Frutex ramosus. Laminæ foliorum minores rhombeo-lanceolatæ.

3. Caulis ramosus. Laminæ foliorum usque 5–8 cm. longæ 2–5 cm. latæ, supra sparse pilosæ ..... 7) *B. spicata*

3. Caulis ramossissimus. Laminæ foliorum usque 2–3 cm. longæ 1 cm. latæ, supra semper glabræ..... 7-a) *B. spicata* var. *microphylla*

2. Herba simplex. Laminæ foliorum majores rhombeo-ovatæ.

3. Caulis petiolique rubro-lutescentes..... 8) *B. paraspicata*

3. Caulis petiolique virides ..... f. *viridis*

6) **Bœhmeria tricuspis** MAKINO (Fig. 4-A) in Bot. Mag. Tokyo, XXVI. p. 387 (1912) — MORI, Enum. Pl. Corea. p. 125 (1922) — MAKINO & NEMOTO, Fl. Jap. p. 1064 (1925) et ed. 2, p. 224 (1931) — MIYABE & KUDÔ, Fl. Hokkaidô and Saghal. IV. p. 490 (1934) — HARA in Bot. Mag. Tokyo, XLVIII. p. 812 (1934) — MASAMUNE in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 159 (1934).

Bœhmeria platyphylla var. *tricuspis* HANCE in Journ. Bot. p. 261 (1874).

Bœhmeria japonica var. *tricuspis* MAXIMOWICZ in Mél. Biol. IX. p. 642 (1876).

Bœhmeria longispica var. *tricuspis* FRANCHET & SAVATIER, Enum. Pl. Jap. II. p. 497 (1877).

Bœhmeria platanifolia var. *tricuspis* MATSUMURA, Ind. Pl. Jap. II.-2, p. 42 (1912).

Bœhmeria rubricaulis MAKINO, l. c. pro syn.

Nom. Jap. *Akaso.*

Hab. *Hokkaidô:* Prov. Isikari: Sapporo (J. MATSUMURA, Jul. 29, 1878) — Mt. Moiwayama (T. NAKAI, Aug. 25, 1920); Prov. Osima-Tokuyama (K. MIYABE et Y. TOKUBUCHI, Jul. 19, 1890). *Honsyû:* Prov. Simotuke: Nikko (J. MATSUMURA, Jul. 27, 1877); Prov. Iwasiro: Aizu (J. MATSUMURA, Aug. 4, 1879) — Sukagawa (S. HATTORI, Aug. 21, 1920); Prov. Ômi: Mt. Ibuki (J. MATSUMURA, Aug. 1, 1881); Prov. Etigo: Deyumura (J. MATSUMURA, Aug. 7, 1884) — Simizutôge (J. MATSUMURA, Jul. 19, 1886); Prov. Uzen: Hondôzi (J. MATSUMURA, Jul. 21, 1887); Prov. Kawati (T. TADA, Aug. 1899); Prov. Kaga: Siranemura (J. NIKAI, Aug. 13, 1909, no. 1901); Prov. Sinano: Mt. Ontake (G. KOIDZUMI, Aug. 1910); Prov. Hida: Takayama (M. HONDA, Aug. 10, 1925) — Gero (T. SATOW, Aug. 24, 1935, no. 5229); Prov. Kai: Mikunitôge (Y. SATAKE, Aug. 17, 1934, no. 341); Prov. Awa: Mt. Kiyozumi (Y. SATAKE, Nov. 5, 1935, nos. 351–356). *Kyûsyû:* Ins. Yakusima (ex MASAMUNE). *Korea:* Prov. Kôgendô: Ins. Uturyôtô (T. NAKAI, Mai. 31, 1917, no. 4243).

Distr. China?

forma **viridipes** SATAKE, f. nov.

Caulis petiolique virides.

Nom. Jap. *Aoziku-akaso* (nov.)

Hab. *Honsyû:* Prov. Awa: Mt. Kiyozumi (Y. SATAKE, Nov. 5, 1935).

Distr. Endemica.

7) **Bœhmeria spicata** THUNBERG (Fig. 4-F) in Trans. Linn. Soc. II. p. 330 (1794) — MIQUEL in Ann. Mus. Lugd.-Bat. III. p. 131 (1867) — FRANCHET & SAVATIER, Enum. Pl. Jap. I. p. 440 (1875) — MAXIMOWICZ in Mél. Biol. IX. p. 645 (1876) — C. H. WRIGHT in Journ. Linn. Soc. XXVI. p. 488 (1899) pro parte — PALIBIN, Consp. Fl. Kor. II. p. 47 (1900) — NAKAI, Fl. Korea. II. p. 198 (1911) — MATSUMURA, Ind. Pl. Jap. II.-2, p. 43 (1912) — MAKINO & NEMOTO, Fl. Jap. p. 1064 (1925) et ed. 2, p. 224 (1931) — MASAMUNE in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 159 (1934) — HATUSIMA in Bull. Exp. For. Kyushu Imp. Univ. no. 4, p. 54 (1934).

Urtica japonica LINNÆUS fil. Suppl. Pl. p. 418 (1781) pro part. major.

Urtica spicata THUNBERG, Fl. Jap. p. 69 (1784).

Bœhmeria platyphylla var. *japonica* WEDDELL in DC. Prodr. XVI.-1, p. 213 (1869).

Bœhmeria longispica (non STEUDEL) FRANCHET & SAVATIER, l. c. pro parte.

Nom. Jap. *Ko-akaso, Ki-akaso.*

Hab. *Honsyû:* Prov. Musasi: Mt. Takao (J. MATSUMURA, Aug. 1878) — Inokasira (J. MATSUMURA, Aug. 28, 1895) — Mt. Kariyose (T. NAKAI, Sept. 1929) — ibid. (M. HONDA, Sept. 19, 1929); Prov. Kazusa: Itinomiya (J. MATSUMURA, Sept. 1880); Prov. Suruga: prope Murayama (J. MATSUMURA, Jul. 1881) — Ômiya (B. HAYATA, Jul. 20, 1924); Prov. Ise: Mt. Asama (J. MATSUMURA, Aug. 6, 1883); Prov. Izu: Mt. Amagi (J. MATSUMURA, Jun. 9, 1883); Prov. Suô: Ôutimura (J. NIKAI, Sept. 1892, no. 155); Prov. Kawati (T. TADA, Aug. 1899); Prov. Yamato: Mt. Bukkyôgadake (G. KOIZUMI, Aug. 13, 1915); Prov. Sagami: hakone (T. NAKAI, Oct. 5, 1930); Prov. Hida: Gero (T. SATOW, Aug. 24, 1935, no. 5236); Prov. Tôtômi: Mt. Akihasan (Y. SATAKE, Aug. 30, 1935, nos. 359, 3510–3513); Prov. Awa: Mt. Nokogiriyama (Y. SATAKE, Nov. 4, 1935, nos. 357–358, 3514). *Sikoku:* Prov. Tosa: Kuromori (J. MATSUMURA, Aug. 3, 1888, no. 178). *Kyûsyû:* Prov. Hyûga: Mt. Kirisima (J. MATSUMURA, Aug. 3, 1882); Prov. Satuma: Siroyama (J. MATSUMURA, Aug. 3, 1882) — Isaku (S. YAJIMA, Oct. 1912, no. 950]; Prov. Tusima (H. HIRATA, Sept. 15, 1901, no. 24) — ibid. (T. NAKAI, Jul. 26, 1921); Prov. Tikuzen: Mt. Unzen (F. C. GRÆTREX, 1931); Prov. Hizen: Mt. Taradake (K. OHKI, Aug. 5, 1934). *Korea:* Prov. Kôgendô: Mt. Kongôzan (T. UCHIYAMA, Aug. 14, 1902) — Nanzandô (T. UCHIYAMA, Oct. 11, 1902) — Ins. Uturyôtô (T. NAKAI, Mai. 31, 1917, no. 4241); Prov. Keisyôhokudô: Taikyû (T. UCHIYAMA, Oct. 7, 1902); Prov. Keisyô-

nandô: Masan (T. MORI, Aug.1 912, no. 109) — Tinkai (T. NAKAI, Mai. 8, 1928, no. 11096) — Ins. Kyosaitô (T. NAKAI, Mai. 5, 1928, no. 11101, 11098) — Tokusan (T. MORI, Aug. 1912, no. 107) — Mt. Chiisan (T. NAKAI, Jun. 30, 1913, no. 125); Prov. Zenranandô: Ins. Ḳwantô (T. NAKAI, Jun. 20, 1913, no. 577); Prov. Kôkaidô: Mt. Hakuyôzan (T. NAKAI, Mai. 3, 1913) — Ins. Taiseitô (T. NAKAI, Jul. 26, 1929, no. 12676) — Ins. Hakureitô (T. NAKAI, Jul. 25, 1929, no. 12672) — Tyôzankan (T. NAKAI, Jul. 27, 1929, no. 12675, 12677, et Jul. 28, no. 12674); Ins. Seizantô (T. NAKAI, Mai. 28, 1928, no. 11095); Ins. Tossantô (T. NAKAI, Mai. 20, 1928, no. 11099); Mt. Mirokuzan (T. NAKAI, Mai. 13, 1928, no. 11097); Lower Chidi (R. K. SMITH, Aug. 30, 1934, no. 16).

Distr. Manchuria and China.

7-a) Bœhmeria spicata var. **microphylla** NAKAI (Fig. 8) in schedl. Herb. Imp. Univ. Tokyo.

Fig. 8. *Bœhmeria spicata* var. *microphylla* NAKAI — type. × $\frac{1}{5}$.

Frutex? Rami ramosissimi, ramulis gracilibus. Folia opposita, pro quaque pare magnitudine et longitudine inæqualia; laminis ovato- vel rhombeo-laceolatis basi cuneatis apice elongato-caudatis, margine arguto-serratis, supra prope glabris vel puberulis in nervis pilosellis, subtus ad nervos pubescentibus, usque 1.5–3 cm. longis 1–1.5 cm. latis; petiolis filiformibus usque 0.5–4 cm. longis. Flores ignoti.

Nom. Jap. *Kobano-koakaso* (NAKAI).

Hab. *Honsyû:* Prov. Izu: Mt. Amagi (T. NAKAI, Jun. 26, 1931-typus in Herb. Imp. Univ. Tokyo).

Distr. Endemica.

8) **Bœhmeria paraspicata** NAKAI (Fig. 9–10), Rep. Veg. Mt. Apoi, p. 17 et 19 (1930) nom. nud. — YAMAMOTO & TSUKAMOTO, Fl. Hakodate, p. 23 (1932) — MIYABE & KUDÔ, Fl. Hokkaido and Saghal. IV. p. 490 (1934) — HARA in Bot. Mag. Tokyo, XLVIII. p. 812 (1934).

Bœhmeria japonica (non MIQUEL) KOMAROV, Fl. Mansch. I. p. 101 (1901).

Bœhmeria japonica (non MIQUEL) NAKAI, Fl. Korea. II. p. 198 (1911) — MORI, Enum. Pl. Corea, p. 125 (1922) pro part. major.

Bœhmeria spicata (non THUNBERG) NAKAI, l. c. p. 198 (1911) pro parte.

Bœhmeria tricuspis (non MAKINO) TATEWAKI, Veg. Mt. Apoi, p. 32 (1928).

Bœhmeria tricuspis var. *paraspicata* HARA, l. c. p. 812 (1934), pro syn.

Fig. 9. *Bœhmeria paraspicata* NAKAI — type. × $\frac{1}{3}$.

Planta herbacea monoica. Caulis erectus simplex usque 60–80 cm. altus, fulvus vel fusco-viridis, tetragono-teres leviter vel distincte 4-sulcatus omnino glabrescens interdum pilosellus. Folia opposita, pro quaque pare magnitudine et longitudine subæqualia; laminæ rhombeo-ovatæ vel ovatæ, ad 5–10 cm. longæ 3–6 cm. latæ, apice acuminato-caudatæ basi subtruncato-cuneatæ vel subrotundatæ, margine arguto-serratæ vel dentato-serratæ serris superiore majoribus 5–10 mm. longis et latis apice excisis inferiore minoribus, supra sparse pilosæ subtus glabræ in nervis præsertim pilosæ, trinerves; petioli 2–5 cm. longi glabri vel sparse ciliati. Spicæ masc. inferne axillares solitariæ; perigonium floris 4-partitum, partibus naviculari-lanceolatis apiculatis extus pilosellis, 4 staminibus, pistillo rudimento clavato glabro. Spicæ fem. superne axillares solitariæ foliis superantes laxe glomeratæ glomerulis 3–4 mm. in diametro. Perigonia fructifera compresse turbinata late complanato-marginata usque 1.5 mm. longa 1 mm.

lata, apice non tubulosa basi cuneata, constanter pubescentia, seminis lenticulari-ovoideis usque 1 mm. longis.

Nom. Jap. *Kusa-koakaso* (NAKAI).

Hab. *Hokkaidô:* Prov. Isikari; Kanayama (G. KOIDZUMI, Aug. 1916 — typus in Herb. Imp. Univ. Tokyo); Prov. Hidaka: Mt. Apoi (T. NAKAI, Aug. 1928). *Honsyû:* Prov. Sinano: Usuitôge (J. MASTUMURA, Jul. 19, 1880) — ibid. (K. Ôi, Sept. 7, 1928); Prov. Suruga: Mt. Fuji (D. SHIMIZU, Jul. 22, 1930, no. 125); Prov. Izu: Mt. Amagi (T. NAKAI, Jul. 22, 1931); Prov. Simotuke: Nikkô (H. ITÔ, 1931); Prov. Musasi: Mameyakezawa (K. HISAUCHI, Jul. 27, 1933); Prov. Tôtômi: circa Inuimati (Y. SATAKE, Aug. 30, 1935, nos. 3515–3521). *Sikoku:* Prov. Tosa: Mt. Tebakoyama (S. YANO, Aug. 10, 1890). *Korea:* Prov. Kôgendô: Mt. Kongôzan (T. UCHIYAMA, Aug. 14, 1902); circa Tyubutuan (T. NAKAI, Jul. 8, 1913, no. 651); Bôgundaisita (T. NAKAI, Aug. 14, 1916, no. 5366); Kenfuturô (T. NAKAI, Aug. 17, 1930, no. 14073). Prov. Keikidô: Nanzan (T. UCHIYAMA, Jul. 16, 1902) — ibid. (N. OKADA, Jul. 19, 1909) — Kôryô (T. MORI, Jul. 7, 1912, no. 239); Prov. Kankyônandô: Genzan (T. NAKAI, Jun. 9, 1909) — Sanbô (T. NAKAI, Aug. 20, 1930, no. 14072); Fluvium Jalu circa Pagum Chone (V. KOMAROV, Sept. 2, 1897).

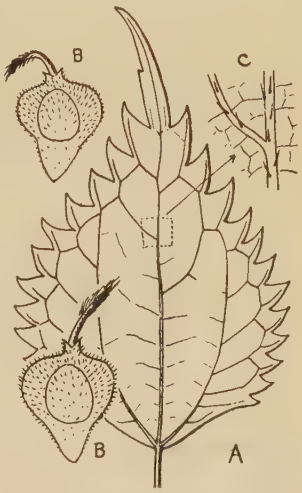

Fig. 10. *Bœhmeria paraspicata* NAKAI; A, under surface of a leaf ×⅔; B, achenes ×ca. 13; C, vein appointed ×ca. 2.6.

Distr. Manchuria and China.

The specimen of *Bœhmeria japonica* sent to the Tokyo Imperial University by Dr. KOMAROV and his specimen in the Paris Museum examined by Professor T. NAKAI are both this *B. paraspicata* NAKAI. This plant was also collected in China in 1932 and 1934 by Mr. S. CHEN.

forma **viridis** SATAKE, f. nov.

Planta omnino viridis.

Nom. Jap. *Ao-koakaso* (nov.).

Hab. *Honsyû:* Prov. Sagami: Mt. Zinba (K. HISAUCHI, Jul. 19, 1931 — typus) — Bidzodani (K. HISAUCHI, Jul. 19, 1931).

Distr. Endemica.

Sect. 3. **Zollingerianæ** SATAKE, sect. nov.

Planta suffruticosa monoica. Caulis ramosus. Folia opposita, pro quaque pare magnitudine et longitudine æqualia; laminis ovatis vel ovato-lanceolatis apice acuminatis basi rotundatis, supra sparse hispidulis subtus pilosis. Glomeruli feminei paniculati terminales, masculi capitati-axillares. Perigonia fructifera ellipsoidea apice longe tubulosa basi subcuneata, constanter pubescentia.

9) **Bœhmeria Zollingeriana** WEDDELL (Fig. 11) in Ann. Sci. Nat. 4 ser. I. p. 199 (1854); Monogr. Fam. Urt. p. 372 (1856) et in DC. Prodr. XVI.-1, p. 208 (1869) — C. H. WRIGHT in Journ. Linn. Soc. XXVI. p. 488 (1899) — MATSUMURA & HAYATA, Enum. Pl. Formos. p. 387 (1906) — KOORDERS, Exkurs. Fl. Java, II. p. 143 (1912) — MERRILL in Philip. Journ. Sci. XIV. p. 381 (1919) et Enum. Philip. Fl. Pl. II.-1, p. 91 (1923) — SASAKI, List of Pl. Formos. p. 158 (1928) et Catal. Govern. Herb. p. 177 (1930) — MAKINO & NEMOTO, Fl. Jap. p. 1064 et ed. 2, p. 224 (1931).

Fig. 11. Achenes of *Bœhmeria Zollingeriana* WEDDELL. ×ca. 13.

Ramium Zollingerianum O. KUNTZE, Rev. Gen. Pl. II. p. 633 (1891).

Nom. Jap. *Nagaba-himemao, Itozaki-himemao.*

Hab. *Formosa:* Sintiku (T. KAWAKAMI & U. MORI, Jun. 1, 1906): Ins. Kasyôtô (T. KAWAKAMI & Z. KOBAYASHI, Aug. 15, 1907): Mt. RANDAIZAN (B. HAYATA, T. KAWAKAMI & U. MORI, Aug. 9, 1908): Kelung (T. KAWAKAMI & S. SASAKI, Apr. 1911): Kuraru (B. HAYATA, Jun. 3, 1912): Karenkô (U. FAURIE): Mt. Nankodaisan (B. HAYATA, Mai. 13, 1916): Heirinzi (B. HAYATA, Mai. 9, 1916): Tannô (B. HAYATA, Mai. 15, 1916).

Distr. China, the Philippines and Java.

Sect. 4. **Sieboldianæ** SATAKE, sect. nov.

Bœhmeria Sect. *Duretia* BLUME in Mus. Bot. Lugd.-Bat. II. p. 212 (1856) pro parte.

Planta monoica. Caulis suffruticosus vel herbaceus, simplex vel ramosus, interdum glaber vel subhirtellus. Folia opposita, pro quaque pare magnitudine et longitudine æqualia; laminæ in sicco sæpe membranaceæ vel papyraceæ rarius coriaceæ, margine æqualiter grosse dentato-serratæ, supra glabræ vel sparse hirtellæ subtus glabræ in nervis sparse puberulæ. Spicæ femineæ et masculæ axillares fere solitariæ. Perigonia fructifera compresse obovoidea vel

turbinata, anguste vel late complanato-marginata, glabra sed apice tantum adpresse puberula.

Clavis specierum

1. Planta robustior. Laminæ foliorum magnæ saepe 15–24 cm. longæ 8–15 cm. latæ. Perigonia florum masculorum 3-partita. Stamina 3..... ..... 10) *B. egregia*
1. Planta gracilior. Laminæ foliorum usque 6–16 cm. longæ 2–10 cm. latæ. Perigonia florum masculorum 4-partita. Stamina 4.
   2. Laminæ foliorum in sicco membranaceæ vel papyraceæ.
      3. Caulis distincte 4-sulcatus. Perigonia fructifera ellipsoidea vel elliptico-ovoidea anguste complanato-marginata fere toto glabra ..... 11) *B. formosana*
      3. Caulis leviter vel fere nunquam 4-sulcatus. Perigonia fructifera compresse obovoidea late complanato-marginata apice plus minus adpresse puberula.
         4. Caulis in sicco fulvo-viridis leviter 4-sulcatus. Laminæ foliorum late ellipticæ vel lanceolatæ..... 12) *B. Sieboldiana*
         4. Caulis in sicco luteo-fulvus fere nunquam 4-sulcatus. Laminæ foliorum anguste ellipticæ vel lanceolatæ .... 13) *B. Nakaiana*
   2. Laminæ foliorum in sicco coriaceæ vel pergameneæ.
      3. Laminæ foliorum pergameneæ, apice acuminatæ longe caudatæ basi obtusæ ..... 14) *B. pseudo-Sieboldiana*
      3. Laminæ foliorum coriaceæ, apice acuminatæ basi rotundatæ.
         4. Laminæ foliorum tenuiores supra subglabræ in nervis primariis hirtellæ subtus glabræ ..... 15) *B. Taquetii*
         4. Laminæ crassiores supra sparse hispidæ subtus densius hirtellæ..... 16) *B. hirtella*

10) **Bœhmeria egregia** SATAKE, sp. nov. (Fig. 4-o; Fig. 12–13)

Planta monoica. Caulis suffruticosus, erectus vel ascendens, ramosus, usque 140–240 cm. altus, inferne teres leviter 4-sulcatus glaber vel subhirtellus lenticellatus, ad 8–14 mm. in diametro, superne tereti-quadrangularis 4-sulcatus sparse vel dense hirtellus, ramulis gracilibus usque 4–7 mm. crassis 60–140 cm. longis hirtellis. Folia opposita, pro quaque pare magnitudine et longitudine æqualia; laminæ foliorum caulinorum sæpe magnæ ellipticæ vel lato- vel ovato-ellipticæ, apice acuminato-caudatæ basi obtusæ vel subrotundatæ, usque ad 15–24 cm.

longæ 8–15 cm. latæ, in sicco subcoriaceæ, trinerves, margine grosse dentato-serratæ serris superiore majoribus 5–7 mm. longis 10–12 mm. latis subapiculatis inferiore minoribus, supra scabriusculæ glabræ vel sparse hirtellæ, præsertim

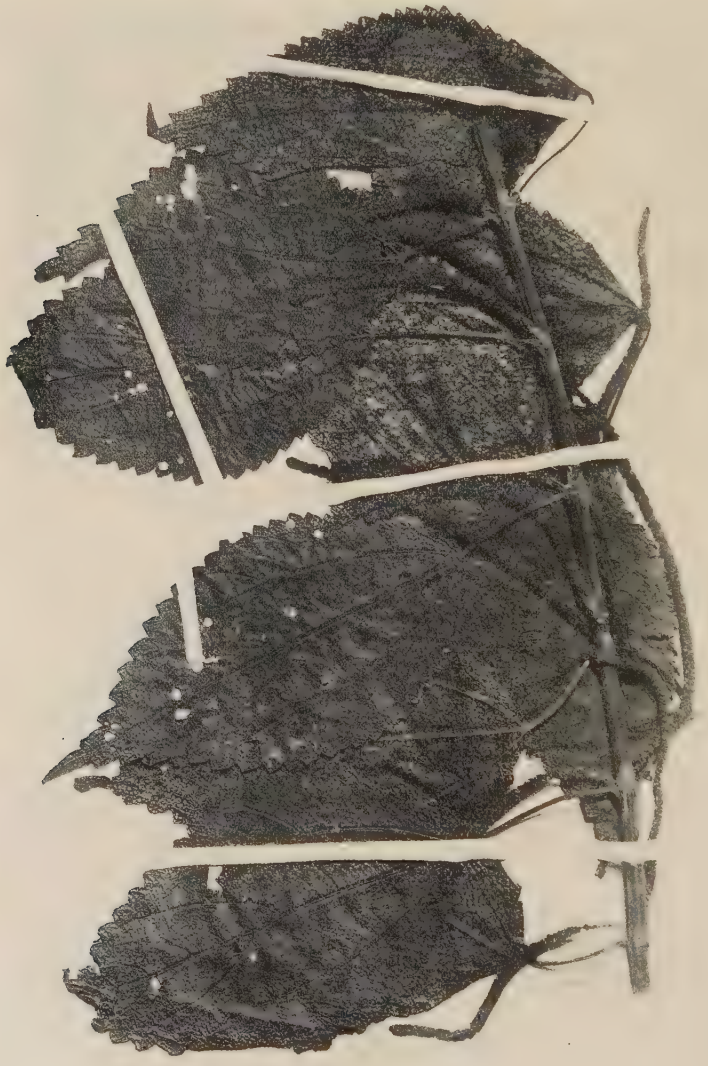

Fig. 12. *Bœhmeria egregia* SATAKE — a middle part of the type specimen. $\times \frac{1}{3}$.

in nervis primariis hirtellæ, cystolithis punctiformibus minutissimis, subtus glabræ in nervis sparse hirtellæ ; petioli 4–9 cm. longi glabrescentes vel hirtelli. Laminæ foliorum ramulorum minores. Stipulæ lanceolatæ 6–8 mm. longæ

1.5 mm. latæ costis extus pilosis. Spica feminea et mascula distincta vel flores feminei in parte superiore earundem spicarum dispositi. Spicæ femineæ sursum axillares solitariæ erecto-ascendentes vel patentes, usque 10–25 cm. longæ 3–5 mm. crassæ, sublaxe interdum conferte glomeratæ. Perigonia fructifera compresse obovoidea late complanato-marginata apice rotundata brevissime tubulosa paulo adpresse puberula, basi cuneato-obtusa glabrata, usque 1.7–2 mm. longa 1 mm. lata. Semina lenticulari-ovoidea apice acuta basi rotundata ad 1 mm. longa. Spicæ masculæ inferne axillares solitariæ vel ramosæ; perigonium floris 3-partitum rarius 4- vel 2-partitum, partibus naviculari-obovatis apiculatis extus subdense pilosis; stamina 3, rarius 4 vel 2; pistillum rudimentum clavatum vel oblongo-ovoideum ad 0.75 mm. longum subpilosum.

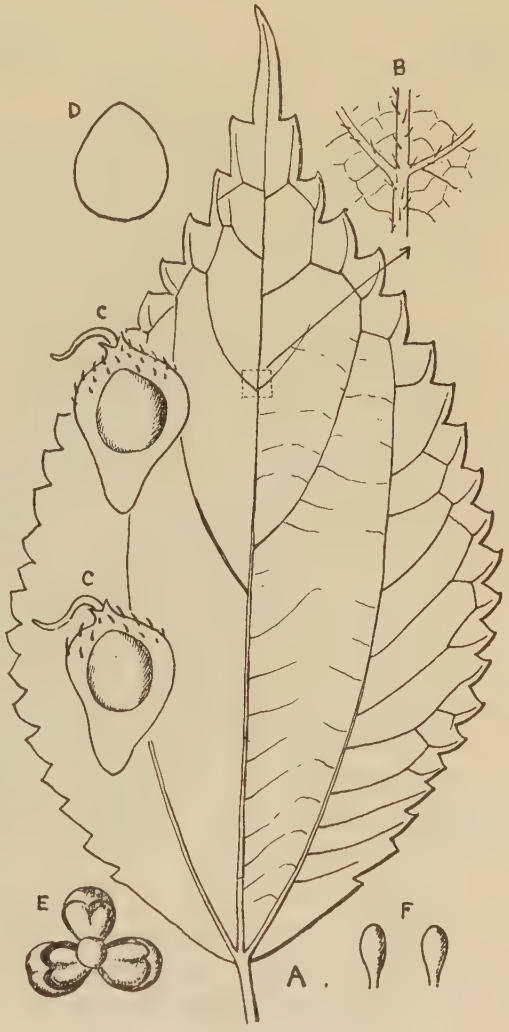

Fig. 13. *Bœhmeria egregia* SATAKE; A, under surface of a leaf ×⅔; B, vein appointed ×ca. 3; C, achenes ×ca. 13; D, a seed ×16; E, surface view of a male flower showing 3 tepals, 3 stamens and rudimentary pistil ×ca. 10; F, lateral view of rudimentary pistil ×ca. 10.

Nom. Jap. *Sima-nagaba-yabumao* (nov.).

Hab. *Honsyû:* Prov. Izu: Ins. Ôsima, prope Motomura (Y. SATAKE, Sept. 9, 1935, no. 3522 — typus, nos. 3523–3525) — ibid. (Y. JÔTANI, Oct. 27, 1929); Ins. Miyakezima, prope Oyama (Y. JÔTANI, Aug. 17, 1932) — ibid. prope Kamitukimura (Y. JÔTANI, Aug. 17, 1932) — ibid. prope Igayamura (Y. JÔTANI, Aug. 10, 1934): Ins. Mikura-

zima (Y. JÔTANI, Jul. 27, 1934); Prov. Awa: Katuura (K. HISAUCHI, Aug. 20, 1921).

Distr. Endemica.

This new species recently found is a native of the islands of Izu and of the province of Awa. It is evidently distinct from *Bœhmeria Sieboldiana* BLUME, in having larger, thicker, and more scabrous leaves, a rigid stem, and by the characters of the male flower.

11) **Bœhmeria formosana** HAYATA (Fig. 16-A), Mater. Fl. Formos. p. 281 (1911) — SASAKI, List of Pl. Formos. p. 157 (1928) et Catal. Govern. Herb. p. 177 (1930) — MAKINO & NEMOTO, Fl. Jap. ed. 2. p. 222 (1931).

Bœhmeria Sieboldiana (non BLUME) MASAMUNE, Prel. Rep. Veg. Isl. Yakusima, p. 68 (1929) pro parte, et in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 159 (1934) pro parte.

Nom. Jap. *Taiwan-toriasi* (HAYATA).

Hab. *Kyûsyû:* Ins. Yakusima (G. MASAMUNE, Sept. 2, 1926). *Ryûkyû:* Ins. Miyakozima (S. TANAKA, Jun. 6, 1891). *Formosa:* Shiringai (G. NAKAHARA, Jun. 1905, no. 68); Hakuhakusha, Taitô (T. KAWAKAMI & Z. KOBAYASHI, Mai. 3, 1906, nos. 1472, 1476); Kôsyun (leg? Mai.); Sinten, Taihoku-syu (T. TANAKA & Y. SIMADA, Jul. 17, 1932, no. 11125).

Distr. China.

The present species is new to the flora of China. Three specimens collected in Chekiang by Messrs Y. Y. HO (no. 642) and S. CHEN (nos. 4343, 4363) are in the Herbarium of the Tokyo Imperial University.

12) **Bœhmeria Sieboldiana** BLUME (Fig 4-G; Fig. 16-B), Mus. Bot. Lugd.-Bat. II. p. 220 (1856) — MIQUEL in Ann. Mus. Bot. Lugd.-Bat. III. p. 131 (1867) — MAXIMOWICZ in Mél. Biol. IX. p. 644 (1876) — FRANCHET & SAVATIER, Enum. Pl. Jap. II. p. 497 (1877) — MATSUMURA, Ind. Pl. Jap. II.-2, p. 43 (1912) — NAKAI, Rep. Veg. Quelpært, p. 39 (1914) pro parte — MORI, Enum. Pl. Corea, p. 125 (1922) pro parte — MAKINO & NEMOTO, Fl. Jap. p. 1064 (1925) et ed. 2, p. 224 (1931) — MASAMUNE, Prel. Rep. Veg. Isl. Yakusima, p. 68 (1929) pro parte, et in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 195 (1934) pro parte — HATUSIMA in Bull. Exp. For. Kyushu Imp. Univ. no. 4, p. 53 (1934).

Bœhmeria longispica var. *Sieboldiana* FRANCHET & SAVATIER, l. c. I. p. 440 (1875).

Bœhmeria platyphylla var. *Sieboldiana* WEDDELL in DC. Prodr. XVI.-1, p. 213 (1869).

Nom. Jap. *Nagaba-yabumao, Kusa-mao.*

Hab. *Honsyû:* Prov. Musasi: Mt. Kariyose (M. HONDA, Oct. 5, 1930) — ibid.

(F. Maekawa, Oct. 27, 1934, no. 8504); Prov. Izu: Mt. Amagi (K. Hisauchi Aug. 24, 1927); Prov. Suô: Ôutimura (J. Nikai, Jul. 30, 1897); Prov. Awa: Mt. Kiyozumi (Y. Satake, Nov. 5, 1935, nos. 3526–3527). *Sikoku:* Prov. Tosa: Sagawamura (T. Makino) — Asizuri (K. Watanabe, Oct. 22, 1891); Prov. Awa: Nisisoyamura (G. Koidzumi, Jun. 28, 1915). *Kyûsyû:* Prov. Higo: Nisinomura (K. Mayebara, Jun. 26, 1927, no. 297); Prov. Ôsumi: Ins. Yakusima (G. Masamune, Aug. 5, 1926). *Korea:* Ins. Quelpært (T. Nakai, Mai. 1913, no. 157) — Mt. Hallasan (T. Nakai, Jun. 1913, no. 344).

Fig. 14. *Bœhmeria Nakaiana* Satake — type. × $\frac{1}{3}$.

Distr. Endemica.

13) **Bœhmeria Nakaiana** Satake, sp. nov. (Fig. 14–15)

Boehmeria Sieboldiana (non BLUME) NAKAI, Rep. Veg. Quelpært, p. 39 (1914) pro parte — MORI, Enum. Pl. Corea, p. 125 (1922) pro parte.

Planta monoica? Caulis suffruticosus erectus ramosus fulvo-lutescens teres multo lenticellatus, inferne haud sulcatus glabratus usque 5 mm. crassus, superne leviter 4-sulcatus glabrescens vel parcissime hirtellus. Folia opposita, pro quaque pare longitudine et magnitudine æqualia; laminæ angusti-ellipticæ vel lanceolatæ, apice acuminato-caudatæ, basi obtuse cuneatæ, usque 8–10 cm. longæ 2.5–4 cm. latæ, supra sublævigatæ vel scabriusculæ sparsissime hirtellæ cystolithis minutissime globosis valde distinctis, subtus glabræ subglaucæ in nervis rarissime hirtellæ; petioli 2–3 cm. longi sparse vel densius hirtelli. Stipulæ subulato-lanceolatæ usque 3–4 mm. longæ 1 mm. latæ costis extus pilosis. Flores masculi ignoti, feminei glomerati et spicas sursum axillari-solitarias laxas vel subconfertas foliis paulo breviores formans. Perigonia fructifera compresse obovoidea late complanato-marginata apice orbicularia brevissime tubulosa sparse adpresse puberula basi cuneata glabrescentia, usque 1.7–2 mm. longa 1 mm. lata. Semina glabra lenticulari-ovoidea ad 0.7 mm longa.

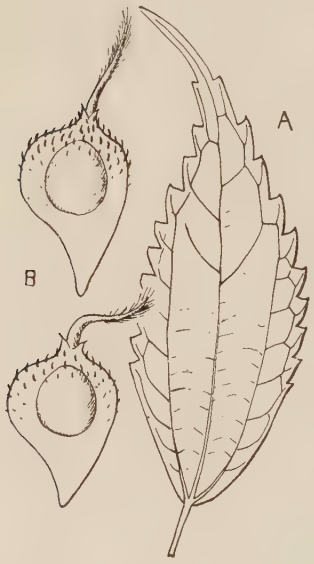

Fig. 15. *Bœhmeria Nakaiana* SATAKE; A, under surface of a leaf ×⅔; B, achenes ×ca. 13.

Nom. Jap. *Saisyû-nagabayabumao* (nov.)

Hab. *Korea:* Ins. Quelpært. (T. NAKAI, Oct. 31, 1917, no. 6156 — typus in Herb. Imp. Univ. Tokyo) — ibid. (E. TAQUET, Sept. 1911, no. 5966).

Distr. Endemica.

This new species resembles *Bœhmeria Sieboldiana* BLUME, but is quite distinct from it in having a scarcely sulcated stem and smaller and narrower leaves.

14) **Bœhmeria pseudo-Sieboldiana** HONDA (Fig. 16-c) in Bot. Mag. Tokyo, XLV. p. 469 (1931) — MAYEBARA, Flor. Aust.-Higo. p. 15 (1931).

Nom. Jap. *Inu-yabumao* (HONDA).

Hab. *Kyûsyû:* Prov. Higo: Ômura (K. MAYEBARA, Aug. 12, 1929, no. 318; Nov. 8, 1626, no. 298).

Distr. Endemica.

15) **Bœhmeria Taquetii** NAKAI, Veg, Isl. Quelpært, p. 39 (1914), nom. nud.; in Fedde, Rep. Sp. Nov. XIII. p. 267 (1914) — MORI, Enum. Pl. Corea, p. 125 (1922).

Nom. Jap. *Saisyû-akaso* (NAKAI).

Hab. *Korea:* Ins. Quelpært (E. TAQUET, Aug. 1911, no. 5965).

Distr. Endemica.

16) **Bœhmeria hirtella** SATAKE, sp. nov.

Bœhmeria Sieboldiana var. *scabra* NAKAI, Rep. Veg. Quelpært, p. 39 (1914) nom. nud. — MORI, Enum. Pl. Corea, p. 125 (1922).

Folia opposita, laminis ovatis acuminatis basi rotundatis usque 10–12 cm. longis 5–6 cm. latis margine grosse arguto-serratis supra scabridis sparse hispidis subtus subdense hirtellis, petiolis 2–2.5 cm. longis dense hirtellis. Flores et achenia ignota.

Nom. Jap. *Ke-nagabaya-bumao* (nov.).

Hab. *Korea:* Ins. Quelpært (E. TAQUET, Aug. 16, 1910, no. 4433).

Distr. Endemica.

Close to *Bœhmeria Sieboldiana* BLUME, but the leaves are thicker, more scabrous, and hairy on the under surfaces. The type specimen lacks a flower, hence its natural position is doubtful.

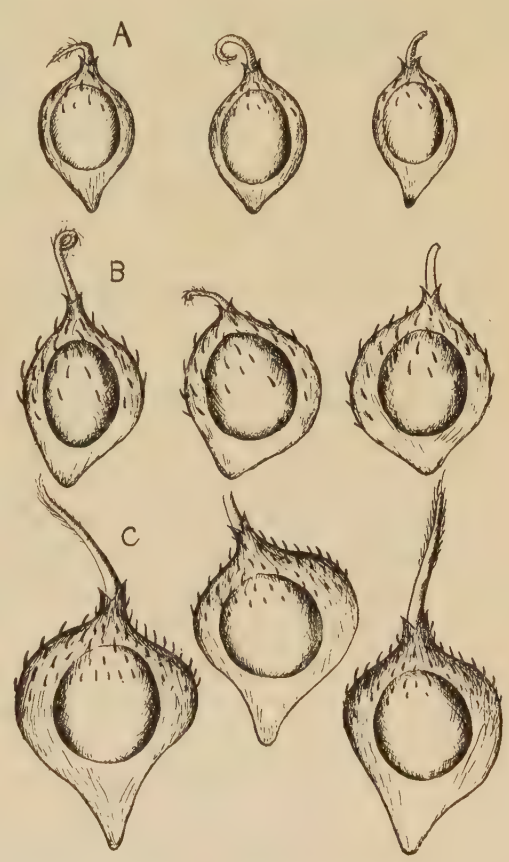

Fig. 16. Achenes of *Bœhmeria formosana* HAYATA (A), *B. Sieboldiana* BLUME (B), and *B. pseudo-Sieboldiana* HONDA (C). ×ca. 13.

Sect. 5. **Splitgerbera** SATAKE, comb. nov.

Splitgerbera MIQUEL, Comm. Phytogr, III. p. 133 (1840).

Bœhmeria Sect. *Duretia* BLUME, Mus. Bot. Lugd.-Bat. II. p. 212 (1856) pro pte.

Suffrutex monoicus. Folia opposita, pro quaque pare magnitudine et longitudine inæqualia vel æqualia; laminæ margine crenulatæ vel crenatæ vel crenato-serratæ, petiolis sæpe laminis multo brevioribus. Spicæ femineæ sursum axillares sæpe crassæ cum floribus confertissime glomeratis, foliis vel petiolis breviores vel rarius longiores. Perigonia fructifera oblanceolata vel elongato-turbinata, anguste vel plus minus complanato-marginata, apice obtusa vel subretusa dense hispida, basi longe cuneata pubescentia.

Clavis specierum et varietatum

1. Laminæ foliorum margine æqualiter crenulatæ. Spicæ femineae semper foliis vel petiolis valde breviores.
   2. Folia paria longitudine et magnitudine æqualia..... 17) *B. biloba*
   2. Folia paria longitudine et magnitudine valde inæqualia..... ..... 18) *B. pilosiuscula*
1. Laminæ foliorum margine crenatæ vel crenato-serratæ. Spicæ femineæ foliis breviores vel paulo longiores sed nunquam petiolis breviores.
   2. Laminæ foliorum rhombeo-ovatæ vel ovatæ, margine heterodontæ, superiore crenato-serratæ, infimæ grosse crenatæ. Perigonia fructifera elongato-turbinata apice subretusa..... 19) *B. kiyozumensis*
   2. Laminæ foliorum ovato-orbiculares vel late ellipticæ, margine omnino grosse crenatæ vel crenato-serratæ. Perigonia fructifera oblanceolata apice obtusa.
      3. Laminæ foliorum majores, margine grosse crenatæ.
         4. Spicæ femineæ crassæ, foliis longiores. Petioli dense hirsuti vel hispidi..... 20) *B. arenicola*
         4. Spicæ femineæ foliis breviores. Petioli glabrescentes..... ..... 20-a) *B. arenicola* var. *awana*
      3. Laminæ foliorum minores, margine crenato-serratæ.
         4. Caulis in sicco fulvus vel luteo-fulvus. Laminæ foliorum ovato-orbiculares vel late ellipticæ tenuiores. Spicæ femineæ foliis paulo longiores vel æquantes .. 21) *B. tenuifolia*
         4. Caulis in sicco atro-fuscus. Laminæ foliorum ovatæ. Spicæ femineæ foliis breviores..... ..... 21-a) *B. tenuifolia* var. *nigricans*

17) **Bœhmeria biloba** WEDDELL (Fig. 4-M; Fig. 17-B) in Ann. Sci. Nat. ser. 4–1, p. 199 (1854); Monogr. Fam. Urtic. p. 373 (1856) et in DC. Prodr. XVI.–1, p. 208 (1869) — MIQUEL in Ann. Mus. Bot. Lugd.-Bat. III. p. 131 (1867) — FRANCHET

& SAVATIER, Enum. Pl. Jap. I. p. 441 (1875) — MAXIMOWICZ in Mél. Biol. IX. p. 640 (1876) — MATSUMURA, Ind. Pl. Jap. II.-2, p. 41 (1912) — MAKINO, IINUMA's Somoku Dzusetsu, IV. p. 1275, Pl. 1164 (1912) — MAKINO & NEMOTO, Fl. Jap. p. 1062 (1925).

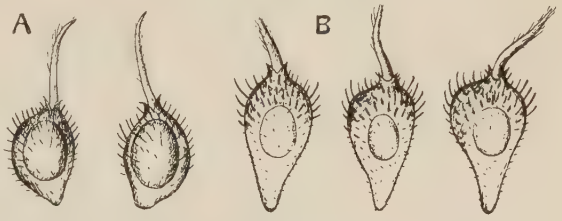

Fig. 17. Achenes of *Bœhmeria pilosiuscula* HASSKARL (A) and *B. biloba* WEDDELL (B). ×ca. 13.

Urtica biloba SIEBOLD, Kruidk. Naamlijt, no. 356, p. 38 (1844).

Urtica bifida SIEBOLD apud HASSKARL, Catal. Pl. Hort. Bot. Bogor. p. 79 (1844).

Splitgerbera japonica MIQUEL, Comment. Phytogr. III. p. 134, t. 14 (1840) — SIEBOLD & ZUCCARINI in Abh. Math.-Phys. Klass. Akad. Wiss. München, IV. Abt. 3, p. 213 (1846).

Bœhmeria bifida BLUME in Plant Distr. (1850) et in Mus. Bot. Lugd.-Bat. II. p. 222 (1856).

Bœhmeria Splitgerbera KOIDZUMI in Bot. Mag. Tokyo, XL. p. 345 (1926) — MAKINO & NEMOTO, Fl. Jap. ed. 2, p. 224 (1931) — YAMAMOTO & TSUKAMOTO, Fl. Hakodate, p. 23 (1932) — MIYABE & KUDÔ, Fl. Hokkaido and Saghal. IV. p. 489 (1934).

Ramium japonicum O. KUNTZE, Rev. Gen. Pl. II. p. 632 (1891).

Nom. Jap. *Raseitasô, Biródo-karamusi.*

Hab. *Hokkaidô:* Prov. Osima: Eramati (K. MIYABE & Y. TOKUBUCHI, Jul. 21, 1890) — Hakodate (T. SATOW, Nov. 1925); Prov. Iburi: Muroran (H. IWAMOTO, Sept. 3, 1931, no. 904). *Honsyû:* Prov. Izu: Ins. Ôsima (leg? Apr. 18, 1887) — Ins. Aogasima (N. MATSUZAKI, Jun. 16, 1920) — Ins. Miyakezima (Y. JÔTANI, Aug. 18, 1932); Prov. Sagami: Kamakura (Y. MOMIYAMA, Oct. 28, 1934, no. 531) — Ôkuzure, circa Hayama (Y. MOMIYAMA, Oct. 28, 1934, no. 530) — ibid. (Y. SATAKE, Jul. 26, 1935, nos. 3550–3553) — Kotubo (Y. MOMIYAMA, Nov. 10, 1935); Prov. Kazusa: Daitôzaki (K. HISAUCHI, Nov. 3, 1934, no. 923); Prov. Awa: Mera (Y. SATAKE, Oct. 29, 1935, no. 3549). Formosa: (ex YAMAMOTO).

Distr. Endemica.

18) **Bœhmeria pilosiuscula** HASSKARL (Fig. 17-A), Catal. Pl. Hort. Bot. Bogor. p. 79 (1844) et Pl. Java. Rar. p. 207 (1848) — BLUME, Mus. Bot. Lugd.-Bat. II. p. 223 (1856).

Urtica pilosiuscula BLUME, Bijdr. Fl. Ned. Ind. 10 Stuk, p. 491 (1825).

Bœhmeria clidemioides MIQUEL in Pl. Jungh. I. p. 34 (1851) et Fl. Ind. Bat. I.-2, p. 252 (1859) — KOORDERS, Exkurs. Fl. Java. II. p. 142, f. 43 (1912) — HANDEL-MAZZETTI, Symb. Sin. VII. p. 152 (1929).

Fig. 18. *Bœhmeria kiyozumensis* SATAKE — type. $\times \frac{1}{3}$.

Bœhmeria platyphylla var. *clidemioides* WEDDELL, Monogr. Fam. Urt. p. 366 (1856) et in DC. Prodr. XVI.-1, p. 212 (1869) — C. H. WRIGHT in Journ. Linn. Soc. XXVI. p. 487 (1899) — MASTUMURA & HAYATA, Enum. Pl. Formos. p. 386 (1906) — SASAKI, List of Pl. Formos. p. 157 (1928) et Catal. Govern.

Herb. p. 177 (1930) — MAKINO & NEMOTO, Fl. Jap. p. 1063 (1925) et ed. 2, p. 223 (1931).

Nom. Jap. *Hiraba-himemao.*

Hab. *Formosa:* Bongarisya (G. NAKAHARA, Sept. 1905, no. 486); Kagi (Y. SHIMADA, Sept. 14, 1917).

Distr. Hainan, China, Java, and India.

19) **Bœhmeria kiyozumensis** SATAKE, sp. nov. (Fig. 4-L; Fig. 18–19)

Suffrutex monoicus? Caulis simplex erectus usque 30–43 cm. altus, inferne teres glabrescens vel subhirsutus ad 3–5 mm. in diametro, superne tereti-quadrangularis 4-sulcatus dense hirsutus. Folia opposita, pro quaque pare magnitudine et longitudine æqualia; laminæ superiore ovatæ vel rhombeo-ovatæ, apice acutæ vel acuminatæ basi obtusæ vel rotundatæ, usque 7–14 cm. longæ 5–9 cm. latæ, margine serratæ vel crenato-serratæ serris superiore majoribus 4–6 mm. longis 6–10 mm. latis inferiore minoribus; laminæ infimæ superioribus minores, late ovatæ apice acutæ vel obtusae basi obtuso-orbiculares, margine grosse crenatæ; supra ruguloso-scabræ hispidæ, subtus pubescentes præsertim in nervis patenti-hispidulæ; petioli 2–5 cm. longi plus minus vel densius hispidi. Stipulæ lanceolatæ ad 8 mm. longæ 2 mm. latæ costis extus hirsutis. Flores masculi ignoti, feminei spicati, spicis sursum axillaribus solitariis erecto-ascendentibus usque 6–16 cm. longis 4–6 mm. crassis foliis longioribus vel brevioribus subconferte glomeratis. Perigonia fructifera compresse turbinato-obovoidea ad 1.7–2 mm. longa 1 mm. lata, late complanato-marginata, apice obtusa vel fere retusa brevissime tubulosa dense hispida, basi cuneata pubescentia. Semina lenticulari-ovoidea ad 0.7 mm. longa.

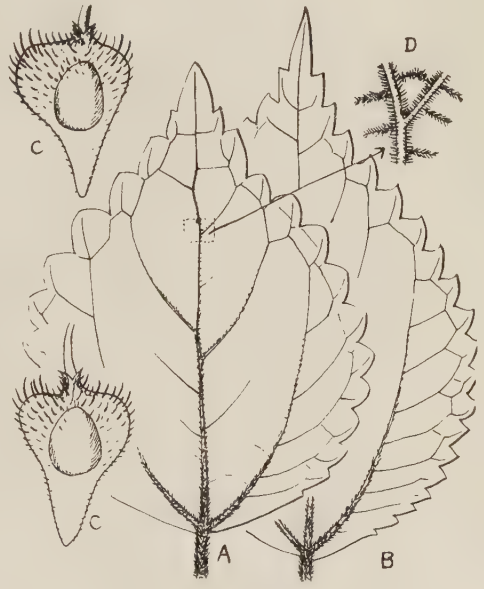

Fig. 19. *Bœhmeria kiyozumensis* SATAKE; A, lowest and B, upper leaf seen from the under surface ×⅔; C, achenes ×ca. 13; D, vein appointed ×2.

Nom. Jap. *Kiyozumi-yabumao* (nov.)

Hab. *Honsyû:* Prov. Awa: Mt. Kiyozumi (H. HARA, Nov. 5, 1934-typus in Herb. Imp. Univ. Tokyo.) — ibid. (K. HISAUCHI, Aug. 20, 1921) — ibid. (Y. SATAKE, Nov. 5, 1935, nos. 3554–3556).

Distr. Endemica.

Fig. 20. *Bœhmeria arenicola* SATAKE — a part of the type. $\times \frac{1}{3}$.

This new species is characteristic in its leaves with dimorphic serrations (upper leaves with mucronate serration and the lowest with crenation) and turbinate achenes.

20) **Bœhmeria arenicola** SATAKE, sp. nov. (Fig. 4-P; Fig. 20–21)

Suffrutex monoicus? sæpe arenicola. Caulis erectus vel subascendens usque 100–165 cm. altus simplex vel ramosus, inferne teres glabrescens sparse lenticellatus ad 1–1.4 cm in diametro, superne tetragono-teres leviter 4-sulcatus pubescens vel hirsutus, ramulis gracilibus inferne glabris superne pubescentibus leviter 4-

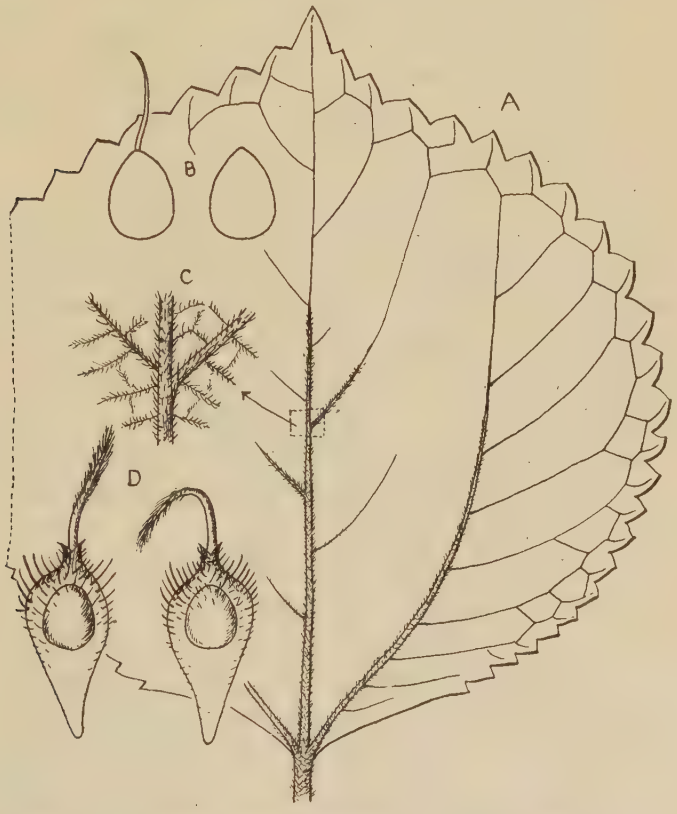

Fig. 21. *Bœhmeria arenicola* SATAKE; A, under surface of a leaf ×$\frac{2}{3}$; B, seeds ×16; C, vein appointed ×ca. 3; D, achenes ×ca. 13.

sulcatis. Folia opposita (vel in ramulis alterna), pro quaque pare longitudine et magnitudine subæqualia, ascendentia vel patentia rarius reflexa; laminæ caulinæ orbiculares vel ovato-orbiculares adulte 14–20 cm. longæ 13–18 cm. latæ, apice breve acuto-acuminatæ vel obtusiusculæ, basi rotundatæ vel cuneato-rotundatæ, margine superiore grosse crenatæ crenis majoribus 3–5 mm. longis 10 mm. latis, inferiore crenato-serratae serris minoribus, supra scabro-hispidæ cystolithis minutissime globosis interdum indistinctis, subtus pubescentes præsertim in nervis hispidulæ, petiolis laminis brevioribus hispidulis; laminæ ramulorum sæpe

minores usque 7–12 cm. longæ 6–9 cm. latæ, late ellipticæ apice acuto-acuminatæ basi cuneato-obtusæ vel -rotundatæ, margine crenato-dentatæ dentibus 2–3 mm. longis 5–7 mm. latis, supra scabro-hispidæ subtus sparse pubescentes in nervis dense hirsutæ, petiolis 1–3 cm. longis dense hirsutis. Stipulæ lanceolatæ submembranaceæ costis extus pilosis. Flores feminei secus spicam subconferte glomerulati, spicis sursum axillaribus erecto-ascendentibus foliis longioribus vel brevioribus adulte 25–35 cm. longis 1 cm. crassis. Perigonia fructifera oblanceolato-obovoidea usque 2 mm. longa 1 mm. lata, apice breve tubulosa hispida basi cuneata glabrata. Semina compresse ovoidea ad 0.8 mm. longa 0.5 mm. lata apice acuta basi rotunda. Flores masc. ignoti.

Nom. Jap. *Hama-yabumao* (nov.).

Hab. *Honsyû:* Prov. Sagami: Yosihama (Y. SATAKE, Oct. 16, 1935, no. 3557 — typus; no. 3558) — Manazuru (Y. SATAKE, Oct. 16, 1935, nos. 3559–3560); Prov. Awa: Otohama (Y. SATAKE, Oct. 29, 1935, nos. 3561–3563) — prope Mt. Nokogiriyama (Y. SATAKE, Nov. 4, 1935, nos. 3564–3565); Prov. Sagami: Kotubo (Y. MOMIYAMA, Nov. 10, 1935).

Distr. Endemica.

This new species is rather close to *Bœhmeria biloba* WEDD. but differs from it in its roundish leaves with large crenations and thick spikes which are much longer than the leaves.

20-a) Bœhmeria arenicola var. **awana** SATAKE, var. nov.

Caulis erectus usque 50–110 cm. altus, inferne teres glabrescens 5–8 mm. crassus, superne tetragono-teres 4-sulcatus hirsutus. Folia opposita erecto-patentia vel rarius reflexa; laminæ late ellipticæ vel ovato-orbiculares usque 13–19 cm. longæ 10–16 cm. latæ apice subacutæ basi rotundatæ vel cuneato-rotundatæ vel cordatæ, margine superiore grosse crenatæ crenis 5 mm. longis 10–12 mm. latis inferiore minute crenato-serratæ, supra ruguloso-scabridæ glabratæ vel sparse hispidæ cystolithis minutissime globosis sæpe indistinctis, subtus parce puberulæ in nervis sparse hispidulæ; petioli laminis valde vel paulo breviores, glabriusculi vel sparse pubescentes. Spicæ femineæ axillares solitariæ 10–13 cm. longæ 5 mm. latæ, floribus subconferte glomeratis, foliis breviores. Perigonia fructifera oblanceolato-obovoidea ad 2 mm. longa 0.8 mm. lata, apice obtusa hispida basi cuneata glabrescentia, seminibus lenticulari-ovoideis ca. 0.7 mm. longis 0.5 mm. latis. Flores masculi ignoti.

Nom. Jap. *Awa-no-hamayabumao* (nov.).

Hab. *Honsyû:* Prov. Awa: prope Mt. Nokogiriyama (Y. SATAKE, Nov. 4, 1935, no. 3566 — typus; no. 3567) — Otohama (Y. SATAKE, Oct. 29, 1935, nos. 3568–3571).

Distr. Endemica.

21) **Bœhmeria tenuifolia** SATAKE, sp. nov. (Fig. 22–23)

Suffrutex monoicus? Caulis simplex erectus basi subascendens usque 80–100 cm. altus, in sicco fulvus vel luteo-fulvus, inferne glaberrimus teretiusculus

Fig. 22. *Bœhmeria tenuifolia* SATAKE — type. ×$\frac{1}{3}$.

vel subcompressus ad 5–7 mm. crassus, superne subtereti-tetragonus 4-sulcatus glabratus vel hirtellus. Folia opposita vel inferne interdum subopposita ; laminæ

tenuiores late ellipticæ vel ovato-orbiculares, usque 9–15 cm. longæ 7–12 cm. latæ, apice acuto-acuminatæ basi rotundatæ vel cuneato-rotundatæ, trinerves, margine æqualiter dentato-serratæ, serris superiore majoribus, ad 3–7 mm. longis 5–7 mm. latis inferiore minoribus, supra ruguloso-hispidæ subtus pubescentes in nervis sparse hispidæ; petioli 3–5 cm. longi sparse vel densiuscule hispiduli. Stipulæ lanceolatæ usque 5 mm. longæ 1.5 mm. latæ costis extus hirsutis. Flores masculi ignoti. Spicæ femineæ solitariæ axillares erectæ vel erecto-ascendentes ad 8–17 cm. longæ 5 mm. crassæ, floribus subconferte glomeratis, foliis fere breviores. Perigonia fructifera oblanceolato-obovoidea, usque 1.5–2 mm. longa 0.7–0.8 mm. lata, anguste complanato-marginata, apice obtusa breve tubulosa villosa, basi longe cuneata glabrata vel parcissime puberula. Semina lenticulari-ovoidea apice actua basi rotundata ad 0.6 mm. longa.

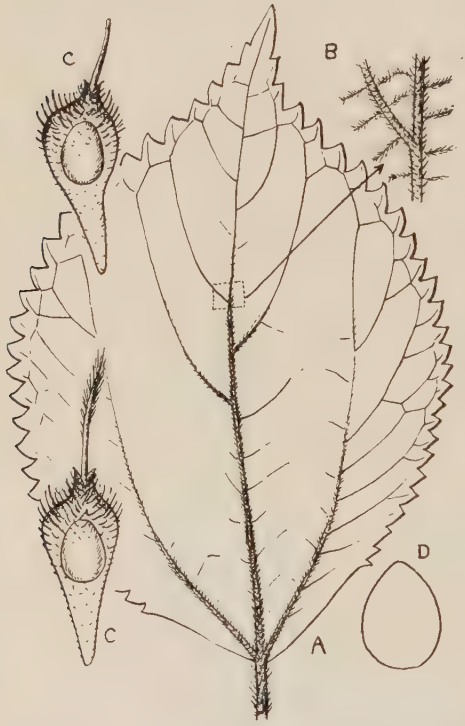

Fig. 23. *Bœhmeria tenuifolia* SATAKE; A, under surface of a leaf ×⅔; B, vein appointed ×2; C, achenes ×ca. 13; D, a seed ×16.

Nom. Jap. *Usuba-raseitasô* (nov.).

Hab. *Honsyû:* Prov. Sagami: prope Kamakura (Y. MOMIYAMA, Nov. 3, 1934, no. 529 — typus in Herb. Imp. Univ. Tokyo.) — ibid. (Y. MOMIYAMA, Sept. 1934, no. 528); Prov. Izu: Insula Ôsima (Y. JÔTANI, Aug. 27, 1929).

Distr. Endemica.

This species resembles *Bœhmeria biloba* WEDDELL, but is distinguished from it by the rounded thin leaves with crenulate serrations, and elongated spikes.

forma **conferta** SATAKE, f. nov.

Spicæ femineæ sæpe erectæ foliis valde breviores cum floribus confertissime glomeratis.

Nom. Jap. *Raseita-modoki* (nov.).

Hab. *Honsyû:* Prov. Sagami: Kotubo, prope Zusi (Y. MOMIYAMA, Nov. 10, 1935).

Distr. Endemica.

This plant is a form intermediate between *Bœhmeria biloba* WEDDELL and *B. tenuifolia* SATAKE.

21-a) Bœhmeria tenuifolia var. **nigricans** SATAKE, var. nov.

Caulis simplex erectus basi prostrato-ascendens, usque 70–90 cm. altus, in sicco atro-fuscus, inferne teres 5–7 mm. crassus glabratus sublævigatus, superne subteres leviter 4-sulcatus pubescens. Folia opposita; laminæ ovatæ vel elliptico-ovatæ usque 9-13 cm. longæ, 7–9 cm. latæ, basi rotundatæ apice acuminatæ, margine æqualiter crenato-serratæ, supra scabro-hispidæ in sicco melanochloræ, subtus pubescentes in nervis dense hispidæ; petioli laminis valde breviores hispidi. Stipulæ lanceolatæ 9.5 mm. longæ 2.5 mm. latæ extus in nervis mediis hirsutæ. Spicæ femineæ erecto-ascendentes axillares usque 5–10 cm. longæ 5 mm. crassæ conferte glomeratæ. Perigonia fructifera oblanceolata 2–2.2 mm. longa 0.7–0.8 mm. lata, apice obtusa breve tubulosa dense hispida, basi longe cuneata glabrata. Semina compresse ovoidea apice acuta basi rotunda ad 0.7 mm longa.

Nom. Jap. *Kuro-usuba-raseitasô* (nov.).

Hab. *Honsyû:* Prov. Izu: prope Simoda (Y. SATAKE, Sept. 4, 1935, no. 3572 — typus; nos. 3573–3576).

Distr. Endemica.

Sect. 6. **Pannosæ** SATAKE, sec. nov.

Planta suffruticosa monoica vel dioica. Caulis erectus simplex vel ramosus. Folia opposita, pro quaque pare magnitudine et longitudine æqualia; laminæ rhombeo-ovatæ, rotundo-ovatæ vel -cordatæ, vel ovato-cordatæ, margine regulariter grosse serratæ, crenatæ, crenato-dentatæ vel dentato-serratæ, subtus dense vel plus minus pubescentes vel holosericeæ vel canescenti-pannosæ rarius hirtellæ, petiolis sæpe brevissimis. Spicæ femineæ sursum axillares erecto-ascendentes solitariæ vel ramosæ subconferte vel laxe glomeratæ foliis æquantes vel longiores. Perigonia fructifera compresse obovoidea plus minus complanato-marginata apice obtusa breve tubulosa dense hispida, basi obtusa vel subcuneata pubescentia.

Clavis specierum

1. Caulis ramosus. Laminæ foliorum minores rhombeo-ovatæ vel ovato-cordatæ, apice acuminato-caudatæ basi cuneato-obtusæ vel truncato-cuneatæ vel rotudatæ subtus pubescentes, margine regulariter grosse serratæ.

2. Laminæ foliorum rhombeo-ovatæ basi cuneato-obtusæ, subtus in nervis glabratæ vel sparse adpresse pilosæ, supra rugoso-scabræ, petiolis junioribus villosiusculis ..... 22) *B. minor*

2. Laminæ foliorum late rhombeo-ovatæ vel ovato-cordatæ tiliaceæ, basi truncato-cuneatæ, subtus in nervis hispidulæ, supra scabridæ petiolis junioribus dense villosis ..... 23) *B. tiliifolia*

1. Caulis simplex. Laminæ foliorum majores rotundato-ovatæ vel -cordatæ vel late elliptico-cordatæ, apice acutæ vel acuto-acuminatæ vel subobtusæ, basi rotundatæ vel cordatæ vel cordato-subcuneatæ rarius obtusæ, subtus dense pubescentes vel hirtellæ vel holosericeæ vel canescenti-pannosæ, margine regulariter grosse crenatæ, serratæ vel dentato-serratæ.

2. Laminæ foliorum ellipticæ, basi truncato-obtusæ, subtus dense hirtellæ ..... 24) *B. kiusiana*

2. Laminæ foliorum rotundato-ovatæ vel -cordatæ, basi rotundatæ vel cordatæ vel cordato-subcuneatæ, subtus pubescentes vel holosericeæ vel canescenti-pannosæ.

3. Laminæ foliorum subtus canescenti-pannosæ vel velutino-holosericeæ præsertim in nervis dense velutino-villosæ, petiolis dense velutino-villosis.

4. Laminæ foliorum 15–18 cm. longæ 12–16 cm. latæ, trinerves interdum quinquenerves, subtus canescenti-pannosæ ..... 25) *B. pannosa*

4. Laminæ foliorum 20–26 cm. longæ 20–23 cm. latæ semper quinquenerves, subtus velutino-holosericeæ..... 26) *B. gigantea*

3. Laminæ foliorum subtus pubescentes vel holosericeæ, præsertim in nervis hispidæ vel villosæ, petiolis hispidis vel villosis.

4. Laminæ foliorum ovato-rotundatæ 20–24 cm. longæ et latæ, apice obtusæ vel subacutæ, basi cuneato-cordatæ, margine grosse crenatæ, tri- vel subquinque-nerves..... ..... 27) *B. grandissima*

4. Laminæ foliorum ovatæ vel ovato-cordatæ vel rotundato-ovatæ, apice acuminato-acutæ basi rotundatæ vel cordatæ, margine crenatæ vel crenato-serratæ, semper trinerves, sæpe laminis *B. grandissimæ* minores.

5. Laminæ foliorum in sicco tenuiores submembranaceæ, supra scabriusculæ ..... 28) *B. hispidula*

5. Laminæ foliorum in sicco crassiores subcoriaceæ, supra scabræ.

Fig. 24. *Bœhmeria minor* SATAKE — type. $\times\frac{1}{3}$.

6. Spicæ femineæ inferiore ramosæ, floribus conferte glomeratis. Perigonia fructifera obovoidea apice hispida ..... 29) *B. quelpærtensis*

6. Spicæ femineæ omnino solitariæ, floribus subconferte glomeratis. Perigonia fructifera oblanceolata vel ellipsoidea apice dense villosa.
   7. Caulis 40–50 cm. altus basi 5–7 mm. crassus, superne dense hirsutus. Laminæ foliorum subtus et supra in nervis primariis dense hirsutæ ..... 30) *B. villigera*
   7. Caulis 80–155 cm. altus basi 8–12 mm. crassus, superne hirsutus. Laminæ foliorum subtus tantum in nervis primariis dense hirsutæ ..... 31) *B. præstabilis*

22) **Bœhmeria minor** SATAKE, sp. nov. (Fig. 4-J; Fig. 24–25).

Bœhmeria japonica var. *minor* NAKAI in schedl.

Suffrutex monoicus? Caulis erectus simplex vel ramosus, inferne teres glaber lenticellatus usque 4-6 mm. in diametro, superne subtetragono-teres leviter 4-sulcatus sparse pubescens vel parce hirtellus, ramulis gracilibus glabris vel pilosis. Folia opposita (vel in ramulis alterna), pro quaque pare longitudine et magnitudine æqualia vel paulo inæqualia; laminæ rhombeo-ovatæ, apice acuminato-caudatæ basi obtusæ vel cuneato-obtusæ, usque 6–15 cm. longæ 4–8 cm. latæ, margine æqualiter dentato- vel subcrenato-serratæ, serris superiore 3–6 mm. longis 5–8 mm. latis inferiore minoribus, supra scabræ vel ruguloso-scabræ hispidæ, subtus pubescentes vel glabrescentes in nervis primariis subglabræ vel sparse adpresse pilosæ; petioli 1–4 cm. longi glabrati vel sparse hirtelli. Stipulæ lineari-lanceolatæ ad 10 mm. longæ 1.5 mm. latae, costis extus pilosis. Spicæ femineæ axillares simplices ascendentes usque 5–15 cm. longæ 4–5 mm. latæ, floribus subconferte vel sublaxe glomeratis, inferiore foliis valde breviores superiore foliis longiores. Perigonia fructifera oblanceolato-obovoidea ad 1.5 mm.

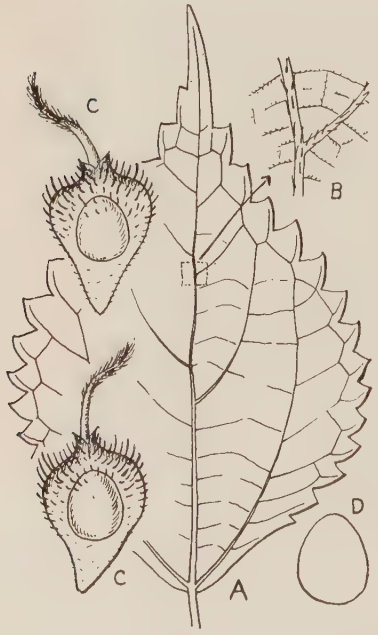

Fig. 25. *Bœhmeria minor* SATAKE; A, under surface of a leaf $\times\frac{2}{3}$; B, vein appointed $\times 2$; C, achenes $\times$ca. 13; D, a seed $\times 16$.

longa 0.7 mm. lata, apice dense hispida basi cuneata glabrata. Flores masculi ignoti.

Nom. Jap. *Ko-yabumao* (NAKAI).

Hab. *Honsyû:* Prov. Sagami: Yokohama (K. HISAUCHI, Sept. 24, 1928 — typus in Herb. Imp. Univ. Tokyo.) — ibid. (K. HISAUCHI, Aug. 19, 1923; Oct. 6, 1930) — prope Zinmuzi (Y. MOMIYAMA, Sept. 9, 1934, nos. 525–527) — ibid. (Y. SATAKE, Jul. 26, 1935, nos. 3528–3530) — Kamakura (MATSUBARA, Oct. 4, 1916) — Yosihama (Y. SATAKE, Oct. 16, 1935).

Distr. Endemica.

23) **Bœhmeria tiliifolia** SATAKE, sp. nov. (Fig. 4-H; Fig. 26–27)

Suffrutex subcæspitosus monoicus? Caulis erectus basi prostrato-ascendens, 100–190 cm. altus, inferne simplex teres subglaber sparse lenticellatus ad 6 mm.

Fig. 26. *Bœhmeria tiliifolia* SATAKE — upper (right) and middle (left) part of the type specimen. ×ca. $\frac{1}{4}$.

crassus, superne ramosus tereti-tetragonus leviter 4-sulcatus plus minus hirtellus, ramulis gracilibus hirtellis vel subglabris fructiferis. Folia opposita (vel in ramulis alterna), pro quaque pare magnitudine et longitudine æqualia; caulina laminis majoribus 10–13 cm. longis 8–11 cm. latis, ramulorum laminis minoribus 7–9 cm. longis 4–6 cm. latis, omnibus tiliaceis ovatis vel subrhombeo-ovatis apice acuminato-caudatis basi truncato-cuneatis vel rotundatis margine dentato-ser-

ratis, serris 5-7 mm longis et latis, supra scabris hispidis in sicco atro-viridibus, cystolithis minutissimis globosis, subtus pubescentibus in nervis sparse hispidis, nervis primariis valde elevatis; petioli laminis breviores glabrescentes vel paulo hispiduli. Stipulæ lanceolatæ ca. 7 mm. longæ 1.5 mm. latæ, costis extus pilosis. Spicæ femineæ axillares solitariæ, ad 10–15 cm. longæ 5 mm. crassæ, floribus laxe glomeratis. Perigonia fructifera immatura compresse obovoidea ad 1.5 mm. longa 1 mm. lata apice dense hispida basi pubescentia. Semina lenticulari-ovoidea ca. 0.7 mm. longa. Flores ♂ ignoti.

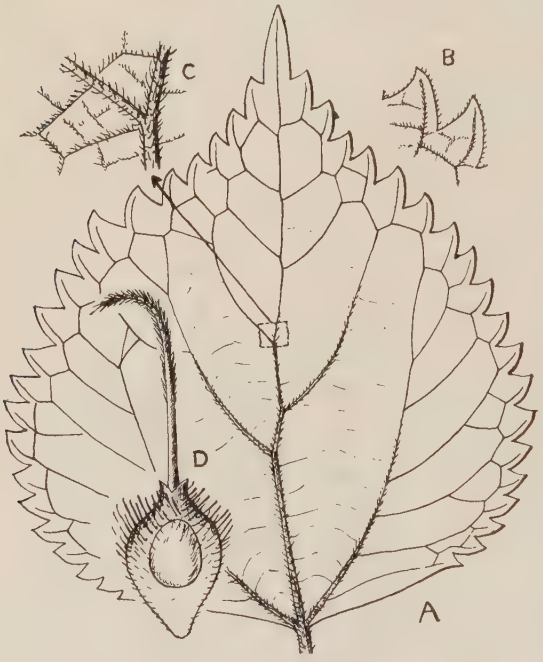

Fig. 27. *Bœhmeria tiliifolia* SATAKE; A, under surface of a leaf ×⅔; B, two serrations seen from the under surface ×ca. 1.3; C, vein appointed ×2; D, achenes ×ca. 13.

Nom. Jap. *Muradati-yabumao* (nov.).

Hab. *Honsyú:* Prov. Izu: prope Simoda (Y. SATAKE, Sept. 5, 1935, no. 3533 — typus in Herb. Imp. Univ. Tokyo; nos. 3534–3540).

Distr. Endemica.

24) **Bœhmeria kiusiana** SATAKE, sp. nov. (Fig. 28–29).

Bœhmeria pseudo-Sieboldiana (non HONDA) HATSUSIMA in Bull. Exp. For. Kyushu Imp. Univ. no. 4, p. 53 (1933)?

Caulis simplex? superne tetragono-teres hirsutus leviter 4-sulcatus ad 2 mm. crassus. Folia opposita, pro quaque pare longitudine et magnitudine subinæqualia; laminæ ellipticæ vel ovato-ellipticæ apice acuminato-caudatæ basi subtruncato-obtusæ, usque ad 14–24 cm. longæ 9–12 cm. latæ, margine subæqualiter grosse dentatæ dentibus apiculatis superiore majoribus 5–7 mm. longis 10–18 mm. latis inferiore minoribus, supra densius hispidæ cystolithis minutissime punctiformibus distinctis, subtus dense hirtellæ in nervis dense vel minus hispidæ; petioli 4–13 cm longi dense vel sparse hirsuti. Stipulæ lanceolatæ ca. 6 mm. longæ 2 mm. latæ costis extus hirsutis. Spicæ femineæ axillares solitariæ

foliis vel petiolis valde breviores, cum floribus laxe glomeratis. Perigonia fructifera immatura compresse obovoidea ad 1 mm. longa 0.5–0.7 mm. lata apice

Fig. 28. *Bœhmeria kiusiana* SATAKE — type. ×$\frac{1}{3}$.

breve tubulosa dense hispidula, basi obtusiuscula pubescentia. Flores masculi ignoti.

Nom. Jap. *Tukusi-yabumao* (nov.).

Hab. *Kyûsyû :* Prov. Tikusen : Sasagurimura (S. HATSUSIMA, Sept. 26, 1932 — typus in Herb. Imp. Univ. Tokyo.).

Distr. Endemica.

This species closely resembles *Bœhmeria Sieboldiana* BLUME in the shape and serration of the leaves, but in the characters of the achenes and hairs of the leaves it is closer to *B. platanifolia* and *B. holosericea*. The writer suspects that the present species is a hybrid between *B. Sieboldiana* and one of the species belonging to Section *Longispicæ*.

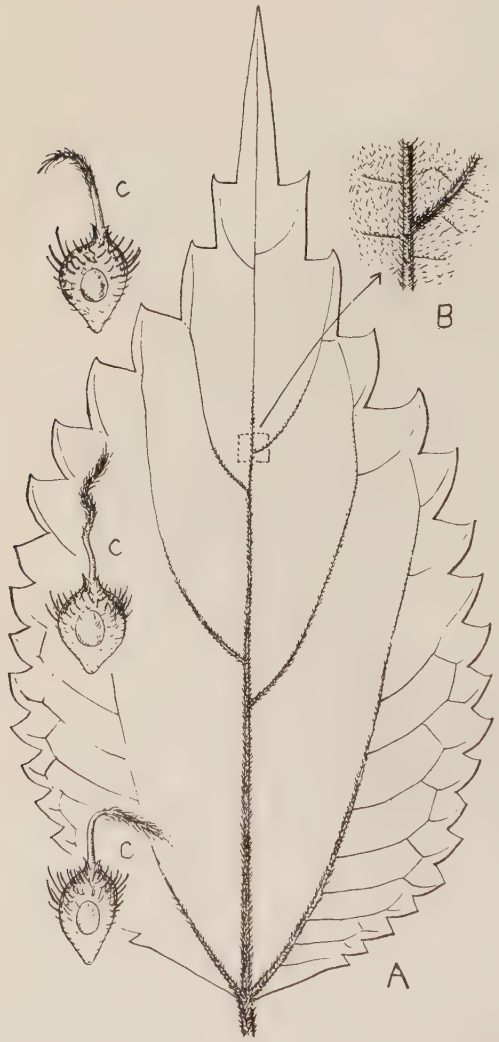

Fig. 29. *Bœhmeria kiusiana* SATAKE; A, under surface of a leaf ×⅔; A, vein appointed ×2; C, immature achenes ×ca. 13.

25) **Bœhmeria pannosa** NAKAI & SATAKE, sp. nov. (Fig. 30).

Bœhmeria holosericea (non BLUME) YABE in Bot. Mag. Tokyo, XVII. p. 177 (1903) — NAKAI, Rep. Veg. Quelpært, p. 39 (1914) pro parte — MORI, Enum. Pl. Corea, p. 125 (1922) pro parte.

Suffrutex dioicus vel monoicus. Caulis simplex tetragonoteres subprofunde 4-sulcatus, in sicco fulvus vel atro-fulvus, superne velutino-tomentosus inferne glabratus usque 4–5 mm. crassus. Folia opposita, pro quaque pare longitudine et magnitudine æqualia; laminæ ovatæ vel ovato-rotundatæ apice acuminato-acutæ basi rotundatæ vel rotundato-cordatæ vel -subcuneatæ, usque ad 12–18 cm. longæ 10–17 cm. latæ, sæpe trinerves vel subquinquenerves, margine æqualiter crenatæ crenis apiculatis vel obtusis superiore majoribus ad 5–6 mm longis 7–10 mm. latis inferiore minoribus, supra scabriusculæ dense curvato-hispidæ cystolithis minutissime punctatis distinctis, subtus dense velutino-pannosæ vel tomentosæ; petioli 3–10 cm. longi

dense velutino-pannosi. Stipulæ lanceolatæ 10–12 mm. longæ 3–4 mm. latæ extus pubescentes costis hispidulis. Inflorescentia mascula paniculata axillaris foliis valde brevior dense pubescens, floribus laxe glomeratis; bractea glomeruli lanceolata glomerulo æquilonga. Perigonia 4-partita, tepalis naviculari-obovatis

Fig. 30. *Bœhmeria pannosa* NAKAI & SATAKE — male type. $\times \frac{1}{3}$.

extus pubescentibus. Stamina 4. Pistillum rudimentum clavatum parvum. Spicæ femineæ axillares solitariæ vel subramosæ, foliis breviores, floribus laxe glomeratis. Perigonia fructifera immatura oblanceolata ca. 2 mm. longa 1 mm. lata, apice breve tubulosa dense villosa, basi subcuneata pubescentia.

Nom. Jap. *Saikai-yabumao* (nov.).

Hab. *Honsyû :* Prov. Nagato : prope Hagi (J. NIKAI, Aug. 24, 1926, no. 2968-2969). *Kyûsyû :* Prov. Tusima (T. NAKAI, Aug. 2, 1921 — ♂ typus) — Izuhara (Y. YABE, Jul. 21, 1901) ; Prov. Iki : Intûzi (K. OHKI, Aug. 4, 1925) ; Prov. Ôsumi : Ins. Birôzima (G. OKA, Aug. 1933 — ♀ typus). *Korea :* Ins. Quelpært (E.

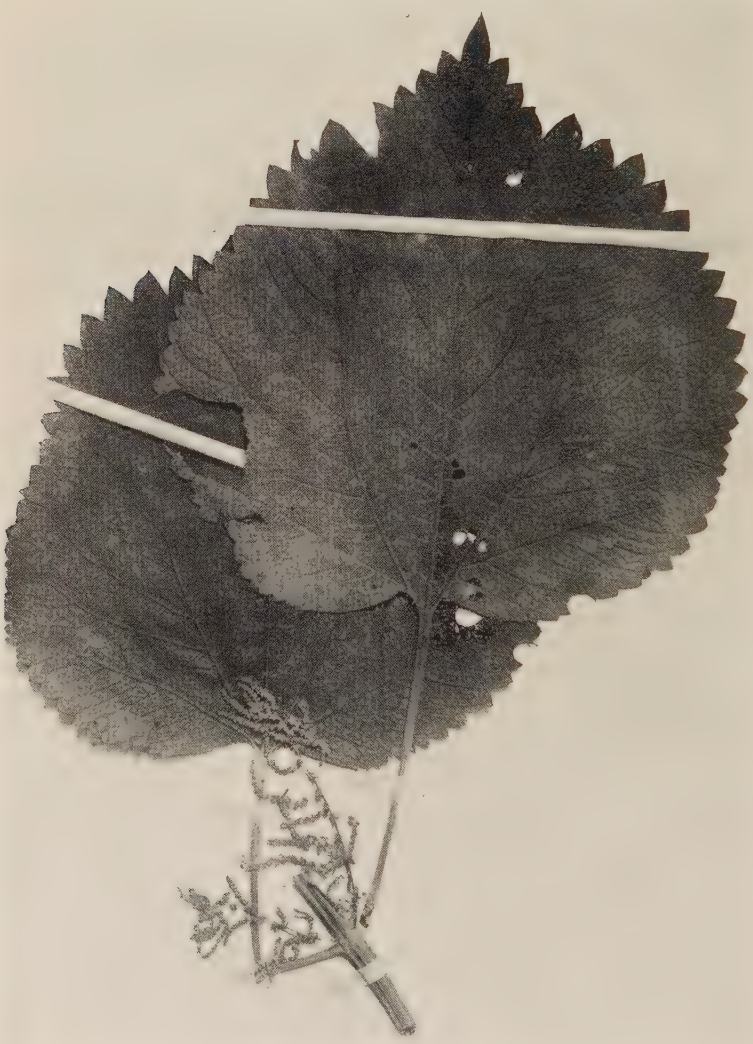

Fig. 31. *Bœhmeria gigantea* SATAKE — a middle part of the type. ×$\frac{1}{3}$.

TAQUET, Aug. 5, 1908, no. 1404) ; Ins. Kyobuntô (T. NAKAI, Mai. 24, 1928, no. 11103) ; Prov. Keisyônandô : Kaiundai (T. NAKAI, Mai. 1, 1928, no. 11093).

Distr. Endemica.

26) **Bœhmeria gigantea** SATAKE, sp. nov. (Fig. 31–32)

Suffruticosa monoicus? Caulis erectus simplex, usque 100–200 cm. altus tereti-tetragonus profunde 4-sulcatus, inferne pubescens vel villosus ad 8 mm. crassus, superne dense villosus vel velutino-villosus. Folia opposita, pro quaque pare magnitudine et longitudine æqualia ; laminæ magnæ ovato-rotundatæ apice acuminato-acutæ basi rotundatæ vel rotundato-cordatæ vel cuneato-rotundatæ, usque 22–26 cm. longæ 19–23 cm. latæ, margine grosse crenato-serratæ serris apiculatis superiore 7–15 mm. longis 10–20 mm. latis inferiore minoribus, supra

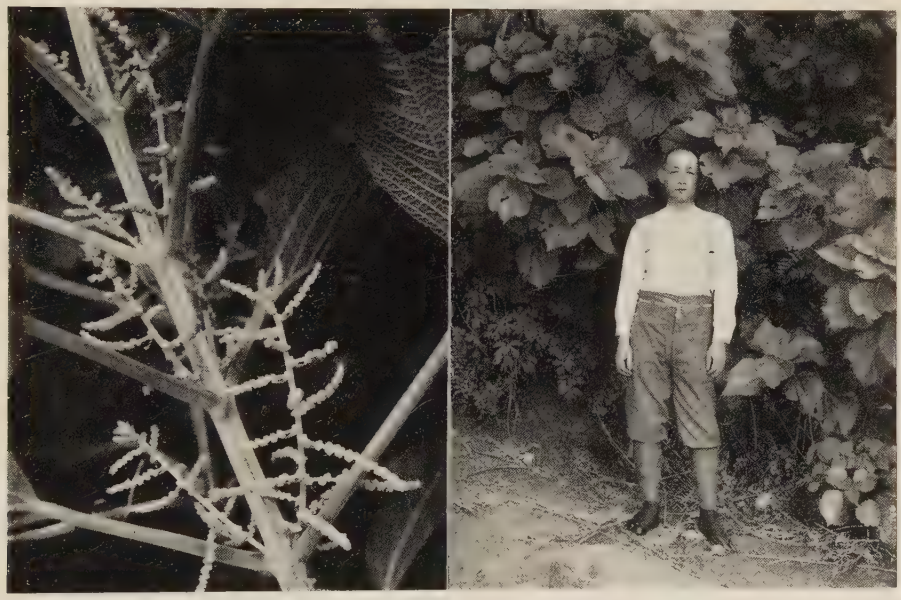

Fig. 32. *Bœhmeria gigantea* SATAKE. The left is paniculate inflorescences, and the right is its habitat at Mazima, Marifu-mura, Prov. Suô. The man in the photo is Professor T. NAKAI (photogr. by Mr. F. MAEKAWA, on 22th July, 1935).

scabriusculæ curvato-hispidæ in nervis primariis impressis dense villosæ, subtus velutino-holosericeæ vel pannosæ præsertim in nervis densissime velutino-villosæ, sæpe 5-nerves ; petioli 7–12 cm. longi dense velutino-villosi. Stipulæ lanceolatæ 12–15 mm. longæ 4–5 mm. latæ extus pubescentes præsertim supra costas hirsutæ. Flores masculi in panicula glomerulati, paniculis axillaribus foliis valde brevioribus ; bracteola lanceolata ca. 5 mm. longa 2 mm. lata extus pubescens costa hirsuta ; perigonium floris 4-partitum, partibus naviculari-ovato-lanceolatis apiculatis extus pilosis ; stamina 4 ; pistillum rudimentum obovoideum glabrum ad 0.6 mm. longum. Perigonia fructifera ignota.

Nom. Jap. *Niô-yabumao* (nov.).

Hab. *Honsyû:* Prov. Suô: Masima, prope Marifumura (T. NAKAI & F. MAEKAWA, Jul. 22, 1935, — typus in Herb. Imp. Univ. Tokyo).

Distr. Endemica.

27) **Bœhmeria grandissima** NAKAI (Fig. 33) in Iyonokuni Sikazima no Shokubutu Chôsa Gaikyô Hôkoku, p. 18 (1927), cum. diagn. Jap.

Fig. 33. *Bœhmeria grandissima* NAKAI — type. × $\frac{1}{4.5}$

Laminæ foliorum rotundatæ vel rotundato-ovatæ, apice obtusæ vel subacutæ basi cordatæ, usque ad 20–23 cm. longæ et latæ, margine grosse crenatæ vel crenato-dentatæ dentibus subapiculatis superiore 7–10 mm. longis 10–20 mm. latis inferiore minoribus, supra sparse hispidæ subtus pubescentes in nervis hispidæ; petioli 12–25 cm. longi subdense hirsuti. Flores ignoti.

Nom. Jap. *Ô-nomao* (NAKAI 1927).

Hab. *Sikoku:* Prov. Iyo: Insula Sikazima (T. NAKAI, Jun. 9, 1927 — typus in Herb. Imp. Univ. Tokyo).

Distr. Endemica.

This plant is close to *Bœhmeria hispidula* BLUME, but it is distinguished from it by its larger and rounded leaves with very large crenations and longer petioles.

28) **Bœhmeria hispidula** BLUME, Mus. Bot. Lugd.-Bat. II. p. 223 (1856) — WEDDELL in DC. Prodr. XVI.–1, p. 214 (1869) — FRANCHET & SAVATIER, Enum. Pl. Jap. I. p. 441 (1875) — KOIDZUMI in Bot. Mag. Tokyo, XL. p. 346 (1926).

Ramium hispidulum O. KUNTZE, Rev. Gen. Pl. II. p. 633 (1891).

Nom. Jap. *Usuba-oniyabumao* (G. KOIDZUMI).

Hab. *Honsyû:* Prov. Izu: Misima (K. HISAUCHI, Aug. 11, 1927; Aug. 27, 1933); Prov. Sagami: Yokohama (K. HISAUCHI, Jul. 30, 1919).

Distr. Endemica.

29) **Bœhmeria quelpærtensis** SATAKE, sp. nov. (Fig. 34 35)

Bœhmeria holosericea (non BLUME) NAKAI, Rep. Veget. Quelpært, p. 39, no. 520 (1914); MORI, Enum. Pl. Corea, p. 125 (1922) pro part. major.

Suffruticosa monoicus? Caulis erectus simplex tereti-tetragonus leviter vel subprofunde 4-sulcatus sæpe hirsutus, usque 4–5 mm. in diametro. Folia

Fig. 34. *Bœhmeria quelpærtensis* SATAKE — type. $\times \frac{1}{3}$.

opposita, pro quaque pare longitudine et magnitudine æqualia; laminæ ovatæ vel rotundato-ovatæ apice acutæ vel acuto-acuminatæ basi rotundatæ vel subcordatæ, usque ad 10–20 cm. longæ 8–16 cm. latæ, margine crenatæ vel crenato-dentatæ dentibus subapiculatis 5–8 mm. longis 7–12 mm. latis inferiore minoribus,

supra scabræ subcurvato-hispidæ in nervis primariis impressis dense hirtellæ, cystolithis minutissimis globosis, subtus subglaucæ pubescentes in nervis hispidæ, sæpe trinervatæ; petioli 2–10 cm. longi dense villosi. Stipulæ lanceolatæ ad 10 mm. longæ 2–2.5 mm. latæ extus pubescentes costis hirsutis. Spicæ femineæ axillares superiore solitariæ inferiore ramosæ sæpe foliosæ foliis breviores, cum floribus conferte glomeratis, usque 6–8 mm. crassæ. Perigonia fructifera compresse obovoidea vel oblanceolato-obovoidea anguste complanato-marginata, apice obtusa breve tubulosa dense hispida, basi subcuneata pubescentia, usque 2 mm. longa 1–1.5 mm. lata. Semina lenticulari-elliptico-ovoidea ca. 1 mm. longa. Flores masculi ignoti.

Fig. 35. Achenes of *Bœhmeria quelpærtensis* SATAKE. ×ca. 13.

Nom. Jap. *Tanna-yabumao* (nov.).

Nom. Quelpærtense. *Puk-nam.*

Hab. *Korea:* Ins. Quelpært (T. NAKAI, Nov. 3, 1917, no. 4999 — typus in Herb. Imp. Univ. Tokyo.) — ibid. (T. NAKAI, Oct. 28, 1917, no. 4997; Oct. 30, 1917, no. 4998) — ibid. (T. ISHIDOYA, Aug. 1, 1912, no. 136).

Distr. Endemica.

forma **glabra** SATAKE, f. nov.

Laminæ subtus glabratæ.

Nom. Jap. *Kenasi-tannayabumao* (nov.).

Hab. *Korea:* Ins. Quelpært (T. NAKAI, Nov. 3, 1917).

Distr. Endemica.

30) **Bœhmeria villigera** SATAKE, sp. nov. (Fig. 36–37)

Planta monoica suffruticosa subcæspitosa. Caulis erectus simplex usque 45–50 cm. altus, inferne teres pubescens ca. 5–7 mm. crassus, superne tereti-quadrangularis leviter 4-sulcatus densissime villosus. Folia opposita, pro quaque pare magnitudine et longitudine æqualia; laminæ late ovato-cordatæ ad. 10–14 cm. longæ 10–12 cm. latæ, apice breve acuminatæ basi subcordato-rotundatæ, margine æqualiter crenato-serratæ serris 3–5 mm. longis 4–8 mm. latis dense hispidulis,

supra dense hispidæ præsertim in nervis primariis villosissimæ cystolithis minutissime punctiformibus interdum indistinctis, subtus dense pubescentes vel holosericeæ in nervis densissime villosæ; petioli usque 1–5 cm. longi laminis

Fig. 36. *Bœhmeria villigera* SATAKE — type. $\times\frac{1}{3}$.

valde breviores villosissimi. Stipulæ lanceolatæ ca. 12 mm. longæ 3 mm. latæ extus pubescentes supra costam hirsutæ. Inflorescentiæ masculæ paniculatæ quam spicæ femineæ deorsum axillares erecto-ascendentes villosissimæ foliis

breviores interdum foliiferæ; perigonium 4-partitum, partibus naviculari-lanceolato-ellipticis apiculatis extus villosis juxta apicem minute appendiculatis; stamina 4; pistillum rudimentum clavato-obovoideum minimum glabrum. Inflorescentiæ femineæ spicatæ, spicis sursum axillaribus erecto-ascendentibus

Fig. 37. *Bœhmeria villigera* SATAKE; A, under surface of a leaf ×⅔; B, vein appointed ×2; C, midrib of the upper surface ×2; D, a serration ×ca. 1.3; E, a male flower showing two tepals (p) with a short appendage near the apex (a), two filaments (f) and a rudimentary pistil (o) ×ca. 10; F, immature achenes ×ca. 13.

solitariis usque 10 cm. longis 5 mm. crassis subconferte glomeratis. Perigonia fructifera immatura ellipsoidea ca. 1 mm. longa 0.5 mm. lata apice hispidula basi pubescentia, stylis longissimis.

Nom. Jap. *Kuma-yabumao* (nov.).

Hab. *Honsyû:* Prov. Izu: Kakizaki, prope Simoda (Y. SATAKE, Sept. 8, 1935, no. 3541 — typus in Herb. Imp. Univ. Tokyo).

Distr. Endemica.

This new species differs from other species of this section in having the cordate leaves with densely hispidous upper surface, densely villose petioles and

stem, and perigons of the male flowers with short appendage near the outer tips.

31) **Bœhmeria præstabilis** SATAKE, sp. nov. (Fig. 4-N; Fig. 38–39)

Planta monoica suffruticosa. Caulis erectus simplex, usque 80–155 cm. altus, in sicco nigro-fulvus, inferne teres subglaber multo lenticellatus lenticellis globosis vel subellipticis, usque 8–12 mm. crassus, superne obtuso-quadrangularis leviter 4-sulcatus dense hirsutus. Folia opposita, pro quaque pare magnitudine et longitudine æqualia; laminæ inferiore ovato-orbiculares vel subcordato-ovatæ,

Fig. 38. *Bœhmeria præstabilis* SATAKE — upper (right) and middle part (left) of the type. ×½

usque 16–20 cm. longæ 16–22 cm. latæ, apice acutatæ vel acuto-acuminatæ, basi rotundatæ vel subcordatæ, margine subæqualiter crenatæ vel crenato-dentatæ dentibus superiore 3–5 mm. longis 8–10 mm. latis subapiculatis inferiore minoribus, supra scabrido-hispidæ in sicco atro-virides cystolithis minute globosis, subtus pubescentes præsertim in nervis hispidæ; nervi primarii 3, supra subimpressi subtus valde elevati; petioli 7–11 cm. longi dense vel sparse hispidi. Laminæ superiore laminis inferioribus minores, late ovatæ vel ovato-cordatæ, usque ad 8–14 cm. longæ 8–13 cm. latæ, apice acuto-acuminatæ basi orbiculares, margine subæqualiter crenato-serratæ serris 2–4 mm. longis 2–6 mm. latis, supra hispidissimæ subtus holosericeæ vel pannosæ præsertim in nervis villigeræ,

trinerves, petiolis 1 cm. longis vel brevissimis dense velutino-villosis. Stipulæ lanceolatæ ad 10 mm. longæ 3 mm. latæ intus glabræ extus pubescentes costis extus longe ciliatis. Flores masculi et feminei in diversam vel in eandem inflorescentiam dispositi. Inflorescentiæ femineæ spicatæ, spicis solitariis axillaribus sursum erecto-ascendentibus columnaribus usque 7–13 cm. longis 6–8 mm. latis

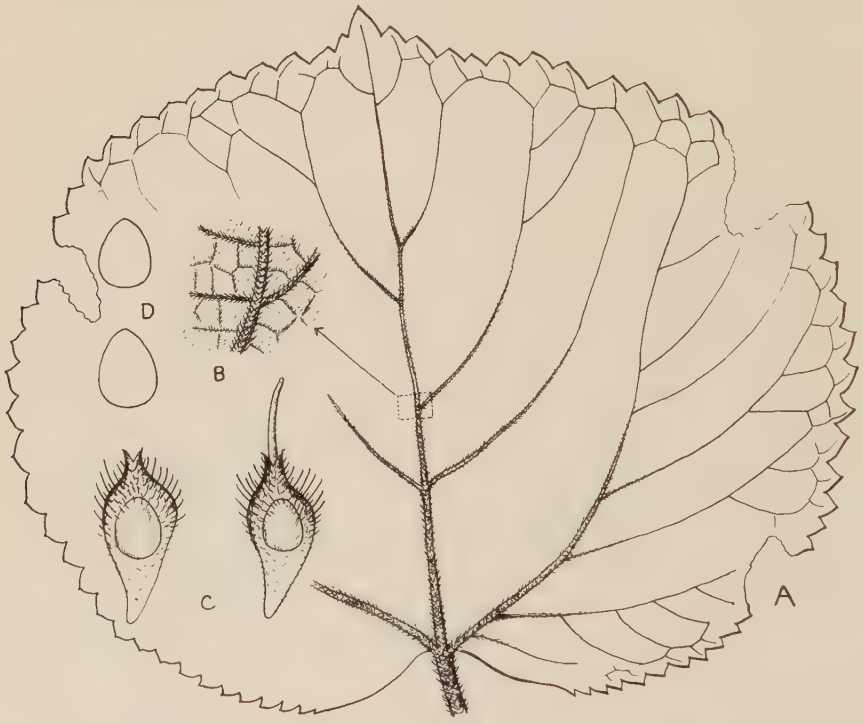

Fig. 39. *Bœhmeria præstabilis* SATAKE; A, under surface of a lowest leaf ×$\frac{2}{3}$; B, vein appointed ×2; C, achenes ×ca. 13; D, seeds ×16.

floribus conferte glomeratis. Perigonia fructifera oblanceolata 2–2.2 mm. longa 0.8–1 mm. lata apice plus minus tubulosa dense hispida basi cuneata pubescentia. Semina lenticulari-ovoidea apice acuta ca. 0.8 mm. longa. Inflorescentiæ masculæ paniculatæ sursum fere femineæ, apicem sæpe foliiferæ; perigonium 4-partitum, partibus naviculari-lanceolatis apiculatis extus hispidulis; stamina 4; pistillum rudimentum obovoideum parvum glabrum.

Nom. Jap. *Izu-no-yabumao* (nov.).

Hab. *Honsyû:* Prov. Izu: prope Simoda (Y. SATAKE, Sept. 5, 1935, no. 3544 — typus in Herb. Imp. Univ. Tokyo; nos. 3545–3548).

Distr. Endemica.

Sect. 7. **Longispicæ** SATAKE, sect. nov.

Bœhmeria Sect. *Duretia* BLUME, Mus. Bot. Lugd.-Bat. II. p. 212 (1856) pro parte.

Caulis simplex vel ramosus. Folia opposita, pro quaque pare longitudine et magnitudine semper æqualia; laminæ ovatæ vel ovato-rotundatæ vel rotundato-cordatæ, margine inæqualiter serratæ apice interdum leviter vel distincte duplicato-serratæ rarius profunde inciso-duplicato-serratæ vel tricuspidatæ, supra hispidæ fere valde scabræ, subtus pubescentes vel holosericeæ vel hirtellæ rarius glabratæ, in sicco coriaceæ vel subchartaceæ. Spicæ femineæ simplices vel ramosæ sursum axillares. Perigonia fructifera compresse obovoidea vel obovato-ellipsoidea plus minus complanato-marginata, apice dense rarius sparse hispida.

Clavis specierum

1. Spicæ femineæ superiore indivisæ inferiore ramosæ.
   2. Laminæ foliorum apice distincte tricuspidatæ..... 32) *B. Maximowiczii*
   2. Laminæ foliorum apice nunquam tricuspidatæ.
      3. Laminæ foliorum subtus hirtellæ. Spica feminea crassa. Perigonia fructifera apice sparse hispida..... 33) *B. pachystachya*
      3. Laminæ foliorum subtus dense pubescentes. Spica feminea gracilis. Perigonia fructifera apice dense hispida.
         4. Laminæ foliorum minores adulte 10 cm. longæ et latæ, basi truncato-cuneatæ..... 34) *B. taiwaniana*
         4. Laminæ foliorum majores adulte 20 cm. longæ et latæ, basi cordatæ vel rotundato-cordatæ.
            5. Laminæ foliorum tenuiores subtus pubescentes nervis plus minus elevatis. Stipulæ lanceolatæ 7 mm. longæ 2 mm. latæ..... 35) *B. robusta*
            5. Laminæ foliorum crassiores duræ, subtus dense pubescentes vel holosericeæ, foveolatæ nervis valde elevatis. Stipulæ oblongo-obovatæ ad 9 mm. longæ 3 mm. latæ..... 36) *B. dura*

1. Spicæ femineæ omnino simplices.
   2. Laminæ foliorum margine arguto-multiserratæ, supra hispidissimæ subtus holosericeæ.
      3. Laminæ foliorum ovatæ, basi obtusæ..... 37) *B. holosericea*

3. Laminæ foliorum late cordato-ovatæ, basi rotundato-cordatæ, petiolis brevissimis ..... 38) *B. izuosimensis*

2. Laminæ foliorum margine pauci-grandiserratæ, serris superiore interdum duplicato-serratis, supra sparse vel densius hispidulæ subtus pubescentes vel glabriusculæ.

3. Laminæ foliorum basi rotundatæ vel subobtusæ rarius truncato-obtusæ, in sicco crassæ subcoriaceæ, subtus in nervis plus minus hispidulæ vel glabratæ ..... 39) *B. longispica*

3. Laminæ foliorum basi truncato-cuneatæ, in sicco fere tenues papyraceæ, subtus in nervis sparse patenti-hispidæ .... 40) *B. platanifolia*

32) **Bœhmeria Maximowiczii** NAKAI & SATAKE, sp. nov. (Fig. 40–42).

Bœhmeria japonica var. *platanifolia* MAXIMOWICZ in Mél. Biol. IX. p. 643 (1876).

Planta herbacea monoica. Caulis erectus simplex, deorsum teres leviter 4-sulcatus glabratus, sursum tetragono-teres subprofunde 4-sulcatus hirtellus, usque 2–3 mm. crassus. Folia opposita, pro quaque pare longitudine et magnitudine æqualia; laminæ late ovatæ, in sicco subpapyraceæ tenuiores, usque 20 cm. longæ 15–20 cm. latæ, margine grandi-serratæ vel duplicato-serratæ serris 15–25 mm. longis 20–25 mm. latis, apice subprofunde tricuspidatæ caudis mediis ensiformibus usque 5–10 cm. longis 4–5 cm. latis 3–5-serrulatis, basi subcuneato-truncatæ, supra scabriusculæ sparse vel plus minus hispidæ cystolithis minutissime globosis, subtus glabriusculæ vel sparse pubescentes ad nervos glabratæ vel puberulæ interdum sparse patenti-hispidæ, trinervatæ; petioli 9 13 cm. longi puberuli. Spicæ femineæ axillares ascendentes, sursum solitariæ deorsum ramosæ, ad 3–5 mm. crassæ, cum floribus laxe glomeratis, foliis breviores vel superantes. Perigonia fructifera oblongo-obovoidea vel -ellipsoidea, ca. 1.3 mm. longa 0.6–0.8 mm. lata, anguste complanato-marginata, apice obtusa brevissime tubulosa dense hirsuta, basi cuneata pubescentia. Semina lenticulari-obovoidea usque 0.7 mm. longa. Flores masculi ignoti.

Nom. Jap. *Ô-meyabumao* (nov.).

Hab. *Honsyû:* Prov. Nagato: prope Hagi (J. NIKAI, Oct. 4, 1926, no. 2970 — typus in Herb. Imp. Univ. Tokyo.); Prov. Simotuke: Hutamatamura (H. SEKIMOTO, Aug. 12, 1930, no. 13); Prov. Hida: Ônada (M. HONDA, Aug. 14, 1925); Prov. Bittyû: Kôda (Z. YOSHINO, Aug. 3, 1921, no. 381); Prov. Musasi: Mt. Siroyama (T. SATOW, Aug. 27, 1938, no. 2138); Prov. Hida: Gero (T. SATOW, Aug. 24, 1935, no. 5230). *Sikoku:* Prov. Tosa: Kuromori (J. MATSUMURA, Aug.

3, 1888). *Kyûsyû :* Prov. Higo : Yamanisimura (H. TAKAHASHI, Sept. 22, 1934, no. 46).

Distr. China.

Fig. 40. *Bœhmeria Maximowiczii* NAKAI & SATAKE — type. ×$\frac{1}{3}$.

According to the sketches made by Professor T. NAKAI from the original specimens of *Bœhmeria japonica* var. *platanifolia* MAXIMOWICZ, the leaves are as in figure 42, and unlike those of the type specimen of *B. platanifolia* FRANCHET & SAVATIER with leaves, such as shown in figure 54. Professor T.

NAKAI suggested to me that MAXIMOWICZ's var. *platanifolia* is most likely an independent species. In concurrence with his opinion, I am treating this as a distinct species. Our specimens from Prov. Nagato, Simotuke, Hida, Tosa and Higo are believed to be of the same kind as MAXIMOWICZ's specimen. This form has also been found in China by Messrs S. CHEN (nos. 1696, 3637, 541, 1632) and Y. Y. Ho (no. 1381).

Fig. 41. Achenes of *Bœohmeria Maximowiczii* NAKAI & SATAKE. ×ca. 13.

33) **Bœhmeria pachystachya** SATAKE, sp. nov. (Fig. 4-B; Fig. 43-44).

Planta suffruticosa monoica? Caulis erectus simplex usque 110–140 cm. altus,

Fig. 42. Two leaves of *Bœhmeria japonica* var. *platanifolia* MAXIMOWICZ (*B. Maximowiczii* NAKAI & SATAKE), sketched by Professor T. NAKAI from the co-type specimen in Paris Museum. a is hairs on the upper surface and b is hairs on the under surface of the leaf. ×$\frac{2}{3}$; a-b, magnified.

inferne teres glabratus ca. 6–8 mm. crassus multo lenticellatus lenticellis ellipticis atro-fuscis, superne tetragono-teres puberulus distincte 4-sulcatus. Folia opposita longe petiolata, pro quaque pare æqualia; laminæ rhombeo-ovatæ vel late ovatæ usque 16–23 cm. longæ 10–17 cm. latæ, margine subæqualiter grandi-

Fig. 43. *Bœhmeria pachystachya* SATAKE — upper part of the type. ×$\frac{1}{3}$.

serratæ serris subapiculatis 10–20 mm. longis et latis, apice subprofunde duplicato-serratæ, basi truncato-obtusæ vel -subrotundatæ, supra scabræ hispidulæ cystolithis minutissime punctiformibus, subtus hirtellæ ad nervos subglabræ

vel sparse puberulæ, trinerves; petioli 6–15 cm. longi sparse puberuli. Spicæ femineæ axillares, deorsum ramosæ graciles floribus sublaxe glomeratis, sursum solitariæ 5–8 mm. crassæ floribus conferte glomeratis. Perigonia fructifera compresse obovoidea vel globosa ca. 2 mm. longa 1.5 mm. lata, late complanato-

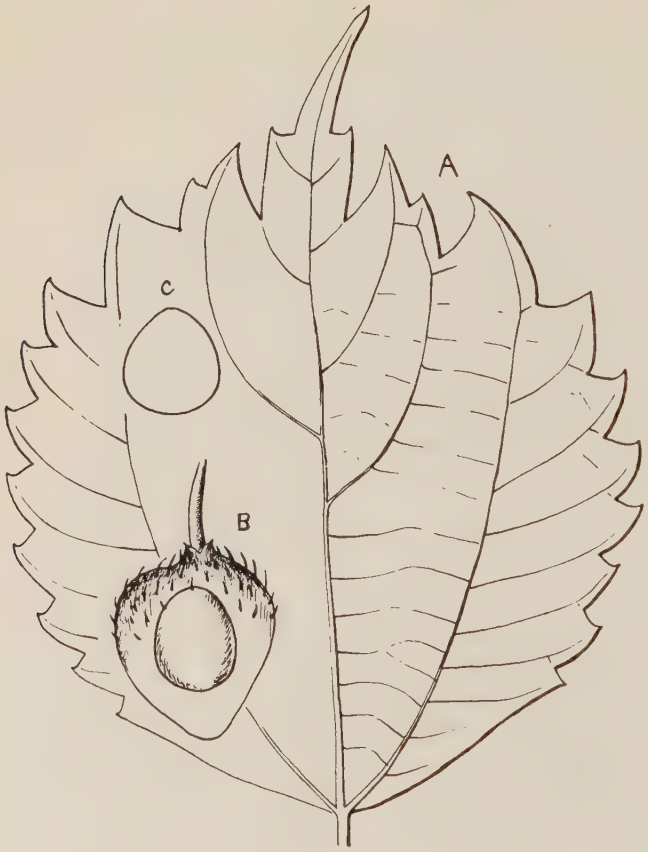

Fig. 44. *Bœhmeria pachystachya* SATAKE; A, under surface of a leaf ×⅔; B, an achene ×ca. 13; C, a seed ×ca. 13.

marginata, apice obtusa vel rotundata sparse hispidula basi obtusa glabrescentia. Semina lenticulari-ovoidea ca. 1 mm. longa et lata. Flores masculi ignoti.

Nom. Jap. *Hutoho-yabumao* (nov.).

Hab. *Honsyû:* Prov. Awa: Mt. Kiyozumi (Y. SATAKE & Y. JÔTANI, Nov. 5, 1935, no. 3577 — typus in Herb. Imp. Univ. Tokyo.; no. 3578).

Distr. Endemica.

34) **Bœhmeria taiwaniana** NAKAI & SATAKE, sp. nov. (Fig. 45–46).

Bœhmeria spicata var. *duploserrata* (non. C. H. WRIGHT) HAYATA, Mater. Fl. Formos. p. 281 (1911) — MAKINO & NEMOTO, Fl. Jap. p. 1064 (1925) et ed. 2, p. 224 (1931) — SASAKI, Catal. Govern. Herb. p. 178 (1930).

Caulis superne tetragono-teres leviter 4-sulcatus dense fusco-hirsutus, usque 3 mm. in diametro. Folia opposita, pro quaque pare magnitudine et longitudine æqualia ; laminæ ovatæ vel ovato-rotundatæ usque 8–10 cm. longæ 6–8 cm. latæ,

Fig. 45. *Bœhmeria taiwaniana* NAKAI & SATAKE — type. $\times\frac{1}{3}$.

margine grosse duplicato-serratæ serris triangularibus ad 7–10 mm. longis 10–15 mm. latis, apice subinciso-serratæ basi cuneatæ vel cuneato-rotundatæ, supra dense hispidæ cystolithis distinctis minutissime globosis, subtus pubescentes præsertim ad nervos dense hirsutæ ; petioli 2–4 cm. longi dense hirsuti. Stipulæ lanceolatæ ca. 6 mm. longæ 1.5 mm. latæ extus pilosæ ad nervos medio hirsutæ.

Spicæ femineæ axillares erectæ, sursum solitariæ deorsum ramosæ, foliis longiores, laxe glomeratæ, ca. 3 mm. crassæ. Perigonia fructifera immatura compresse obovato-ellipsoidea ca. 1.5 mm. longa 0.5–0.8 mm. lata, apice dense hispidula basi obtusa vel subcuneata pubescentia. Flores masculi ignoti.

Fig. 46. Achenes of *Bœhmeria taiwaniana* NAKAI & SATAKE. ×ca. 13.

Nom. Jap. *Taiwan-meyabumao* (nov.), *Taiwan-koakaso* (HAYATA).

Hab. *Formosa:* Nanto: Saramao (E. MATSUDA, Aug. 11, 1919, no. 14 — typus in Herb. Imp. Univ. Tokyo.).

Distr. Endemica.

35) **Bœhmeria robusta** NAKAI & SATAKE, sp. nov. (Fig. 4-c; Fig. 47–48).

Suffruticosa monoicus? Caulis erectus simplex vel ramosus usque 70–110 cm. altus, inferne teres leviter 4-sulcatus glabratus vel subhirsutus ad 6–7 mm. crassus, superne obtuso-tetragonus distincte 4-sulcatus dense vel plus minus hirsutus sparse patenti-hispidus. Folia opposita, paria subæqualia; laminæ ovato-orbiculares vel orbiculares adulte ad 15–20 cm. longæ et latæ, margine grosse dentato-serratæ vel fere duplicato-

Fig. 47. *Bœhmeria robusta* NAKAI & SATAKE — type specimen consisting of three parts. ×ca. $\frac{1}{8}$.

serratæ serris 10–20 mm. longis et latis, apice subprofunde grandi-duplicato-serratæ serris mediis 3–5 cm. longis interdum 2–4-serrulatis, basi truncato-rotundatæ vel -cordatæ, supra scabræ dense hispidæ, subtus pubescentes ad nervos præsertim plus minus vel dense hirtellæ sparse patenti-hispidæ, tri-

nerves; petioli sursum brevissimi deorsum 8–15 cm. longi tomentosi vel hirsuti vel fere hispidi. Stipulæ lanceolatæ 6–7 mm. longæ 2 mm. latæ extus pilosæ costis subhispidis. Spicæ femineæ axillares sursum solitariæ foliis longiores, deorsum solitariæ vel subramosæ foliis sæpe breviores ad 5 mm. crassæ, cum floribus laxe vel subconferte glomeratis. Perigonia fructifera compresse obovoidea vel oblongo-obovoidea 1.8–2 mm. longa 1 mm. lata apice obtusa breve tubulosa dense hispidula, basi longe cuneata pubescentia. Flores masculi ignoti.

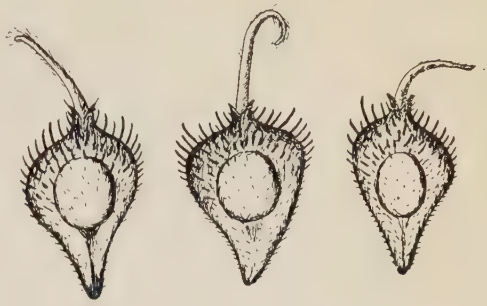

Fig. 48. Achenes of *Bœhmeria robusta* NAKAI & SATAKE. ×ca. 13.

Nom. Jap. *Maruba-yabumao* (nov.).

Hab. *Honsyû:* Prov. Sagami: prope Manazuru (K. HISAUCHI, Oct. 4, 1931, par. I-III. — typus in Herb. Imp. Univ. Tokyo.) — ibidem (Y. SATAKE, Oct. 16, 1935, nos. 3584–3586) — in sylvis Zinmuzi (K. HISAUCHI, Aug. 30, 1931) — ibid. (Y. SATAKE, Jul. 26, 1935, nos. 3579 3580); Prov. Izu: Ins. Ôsima, prope Motomura (Y. SATAKE, Sept. 9, 1935, nos. 3581–3583); Prov. Musasi: Saigôyama, Sibuya (Z. IWATA, Oct. 19, 1935).

Distr. Endemica.

36) **Bœhmeria dura** SATAKE, sp. nov. (Fig. 49–50)

Planta suffruticosa rigida monoica. Caulis erectus simplex vel ramosus, usque 90–130 cm. altus, inferne teres glabrescens vel subhirsutus ad 8–10 mm. crassus multo lenticellatus, superne tetragono-teres leviter 4-sulcatus hirsutus patenti-hispidus. Folia opposita vel subopposita, pro quaque pare longitudine et magnitudine æqualia; laminæ crassæ duræ late ovatæ vel cordatæ, inferiore 13–18 cm. longæ 14–19 cm. latæ margine grosse dentato-serratæ vel -duplicato-serratæ serris 10–15 mm. longis 15–20 mm. latis inferiore sensim minoribus, apice subprofunde duplicato-serratæ, basi rotundato-cordatæ supra rugoso-scabræ dense hispidæ nervis primariis impressis hirsutis cystolithis minutissime globosis fere indistinctis, subtus pubescentes nervis valde elevatis subfoveolatæ, trinervatæ; petiolis 7–10 cm. longis hirsutis; laminæ superiore valde minores usque 5–11 cm. longæ 6–12 cm. latæ supra dense hispidæ subtus dense holosericeæ, petiolis 1–3 cm. longis dense hirsuto-villosis. Stipulæ oblongo-oblanceolatæ apice acutæ ca. 9 mm. longæ 3 mm. latæ intus pubescentes extus ad nervos medios hirsutæ.

Flores masculi et feminei in spicis diversis dispositi vel androgyni. Spicæ femineæ axillares ascendentes sursum solitariæ foliis longiores deorsum ramosæ foliis breviores, floribus laxe vel subconferte glomeratis. Perigonia fructifera com-

Fig. 49. *Bœhmeria dura* SATAKE — upper (left) and middle (right) part of the type. ×¼.

presse obovoidea ca. 1.8 mm. longa 1 mm. lata apice obtusa brevissime tubulosa subdense hispidula, basi subcuneata pubescentia. Semina lenticulari-ovoidea ad 0.9 mm. longa. Flores masculi ignoti.

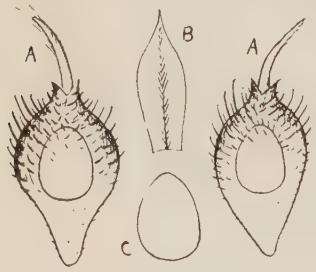

Fig. 50. *Bœhmeria dura* SATAKE; A, achenes ×ca. 13; B, a stipule ×2; C, a seed ×ca. 13.

Nom. Jap. *Kataba-yabumao* (nov.).

Hab. *Honsyû:* Prov. Izu: prope Simoda (Y. SATAKE, Sept. 5, 1935, no. 3587 — typus in Herb. Imp. Univ. Tokyo; nos. 3588–3596); Prov. Oki: Dôgo, Gônoura (M. FURUMI, Jul. 22, 1927).

Distr. Endemic.

37) **Bœhmeria holosericea** BLUME, Mus. Bot. Lugd.-Bat. II. p. 221 (1856) — MIQUEL in Ann. Mus. Bot. Lugd.-Bat. III. p. 131 (1867) — FRANCHET & SAVATIER, Enum. Pl. Jap. I. 441 (1875) — MAXIMOWICZ in Mél. Biol. IX. p. 640 (1876) — MATSUMURA, Ind. Pl. Jap. II.-2, p. 41 (1912) —

Makino & Nemoto, Fl. Jap. p. 1063 (1925) et ed. 2, p. 223 (1931) — Gagnepain in Fl. Gén. L'Indo-Chine, V. p. 843 (1929) — Masamune in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 157 (1934).

Urtica macrophylla Thunberg, Fl. Jap. p. 69 (1784), **syn. nov.**

Fig. 51. *Bœhmeria izuosimensis* Satake — type. × $\frac{1}{3}$.

Bœhmeria macrophylla Siebold & Zuccarini in Abh. Math.-Phys. Akad. Wiss. München, IV.-3, p. 215 (1846), nomen tantum, **syn. nov.**

Bœhmeria platyphylla var. *holosericea* Weddell in DC. Prodr. XVI.-1, p. 212 (1869).

Nom. Jap. *Oni-yabumao, No-mao.*

Hab. *Honsyû:* Prov. Simôsa: Mama (J. MATSUMURA, Aug. 18, 1878) — Sikamata (J. MATSUMURA, Aug. 23, 1878); Prov. Musasi: Tôkyô (J. MATSUMURA, Jul. 13, 1879) — Noborito (K. HISAUCHI, Sept. 11, 1932); Prov. Settu: Mt. Mayasan (J. MATSUMURA, Aug. 15, 1888); Prov. Rikuzen: Sendai (K. HISAUCHI, Oct. 4, 1914); Prov. Suruga: Nagatamura (D. SHIMIZU, Sept. 24, 1930, no. 94); Prov. Izu: Misima (K. HISAUCHI, Aug. 27, 1933); Prov. Sagami: circa Zinmuzi (Y. MOMIYAMA, Sept. 9, 1934, nos. 523–524, 532) — Kamakura (Y. MOMIYAMA, Sept. 1934, nos. 533–534). *Kyûsyû:* Ins. Yakusima (ex MASAMUNE).

Distr. China and Indo-China.

In China, this plant was collected in 1933 by Mr. S. CHEN (no. 2101) in Chekiang. It is very close to *Bœhmeria longispica* STEUDEL (=*B. japonica* MIQUEL), Professor T. NAKAI tells me that he regards the former as a variety of the latter. According to a good sketch made by Professor T. NAKAI, who studied the original specimen of THUNBERG at Uppsala, *Urtica macrophylla* THUNBERG is nothing but a male specimen of *Bœhmeria holosericea* BLUME.

38) **Bœhmeria izuosimensis** SATAKE, sp. nov. (Fig. 51–52)

Suffrutex monoicus? Caulis simplex erectus basi ascendens, in sicco atrofuscus, usque 95 cm. altus, inferne tereti-tetragonus subprofunde 4-sulcatus glabratus vel subpilosus ad 4–6 mm. crassus, superne quadrangulari-teres leviter 4-sulcatus hirsutus. Folia opposita breve petiolata, pro quaque pare longitudine et magnitudine æqualia; laminæ late ovato-cordatæ usque 8–11 cm. longæ et latæ, apice acuminato-acutæ vel acutæ basi rotundato-cordatæ, margine subæqualiter arguto-serratæ serris superiore majoribus interdum duplicato-serratis inferiore minoribus, supra dense hispidæ subtus holosericeæ ad nervos præsertim hispidæ, trinervatæ; petioli 1–3 cm. longi dense villosi. Stipulæ lanceolatæ ad 9 mm. longæ 3 mm. latæ, costis extus hirsutis. Spicæ femineæ sursum axillares erecto-ascendentes solitariæ, usque 6–9 cm. longæ ca. 4 mm. crassæ, cum floribus subconferte glomeratis. Perigonia fructifera immatura compresse oblongo-ellipsoidea ca. 1.5 mm. longa 0.8 mm. lata, apice dense villosa basi subcuneata pubescentia.

Fig. 52. Achenes of *Bœhmeria izuosimensis* SATAKE. ×ca. 13.

Nom. Jap. *Ôsima-yabumao* (nov.).

Hab. *Honsyu:* Prov. Izu: Ins. Ôsima (Y. JÔTANI, Sept. 9, 1931 — typus in Herb. Imp. Univ. Tokyo).

Distr. Endemica.

39) **Bœhmeria longispica** STEUDEL (Fig. 4-D; Fig. 53) in Flora Regensb. XXXIII. p. 260 (1850) — BLUME, Mus. Bot. Lugd.-Bat. II. p. 221 (1856) — FRANCHET & SAVATIER, Enum. Pl. Jap. I. p. 440 (1875).

Acalypha HOUTTUYN, Nat. Hist. XI. Aanwy, Pl. LXXII. fig. 2 (1779); Pflanzensyst. X. t. 72, fig. 2 (1783), cum nota 'Herr Houttuyn etc' sub *Acalypha australis* in p. 226.

Bœhmeria macrophylla SIEBOLD & ZUCCARINI in Abh. Math.-Phys. Akad. Wiss. München, IV-3, p. 215 (1846) excl. syn. *Urtica spicata* THUNBERG.

Bœhmeria grandifolia WEDDELL in Ann. Sci. Nat. 4-ser. I. p. 199 (1854) — C. H. WRIGHT in Journ. Linn. Soc. XXVI. p. 485 (1899) — MATSUMURA, Ind. Pl. Jap. II.-2, p. 41 (1912) — MATSUDA in Bot. Mag. Tokyo, XXVIII. p. 7 (1914).

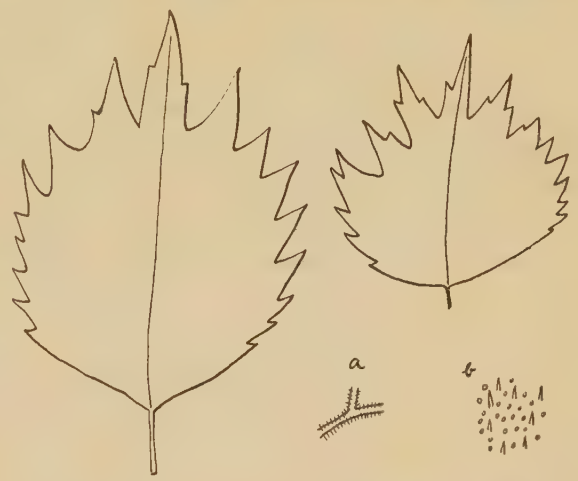

Fig. 53. Two leaves of *Bœhmeria longispica* STEUDEL(=*Bœhmeria japonica* MIQUEL) sketched from the type specimen by Professor T. NAKAI. a is hairs on the vein of the under surface, and b is hairs and cystoliths on the upper surface of the leaf. ×⅔; a-b, magnified.

Bœhmeria platyphylla var. *japonica* WEDDELL, Monogr. Fam. Urtic. p. 365 (1856).

Bœhmeria japonica MIQUEL in Ann. Mus. Bot. Lugd.-Bat. III. p. 131 (1867) — MAXIMOWICZ in Mél. Biol. IX. p. 642 (1876) — MAKINO, IINUMA's Somoku Dzusetsu, IV. p. 1272, Pl. 1161 (1912) — MORI, Enum. Pl. Corea, p. 125 (1922) — MAKINO & NEMOTO, Fl. Jap. p. 1063 (1925) et ed. 2, p. 223 (1931) — MIYABE & KUDÔ, Fl. Hokkaido and Saghal. IV. p. 490 (1934) — MASAMUNE in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 158 (1934).

Bœhmeria platyphylla var. *macrophylla* WEDDELL in DC. Prodr. XVI.-1, p. 212 (1869).

Bœhmeria spicata (non THUNBERG) WRIGHT, l. c. p. 488, excl. syn. *Urtica spicata* THUNBERG et *B. platyphylla* var. *japonica* WEDDELL.

Bœhmeria Miqueliana TANAKA in Bult. Sci. Fukult. Kjusu Imp. Univ. I. p. 198 (1925) — HATUSIMA in Bull. Exp. Forest, Kyushu Imp. Univ. no. 4, p. 53 (1934).

Ramium caudatum O. KUNTZE, Rev. Gen. Pl. II. p. 631 (1891).

Nom. Jap. *Yabumao.*

Hab. *Hokkaidô :* (ex MIYABE et KUDÔ). *Honsyû :* Prov. Musasi : Dôkanyama, Tokyo (J. MATSUMURA, Jul. 13, 1879) — Noborito (K. HISAUCHI, Sept. 11, 1932) — Ômiyahatiman (K. HISAUCHI, Oct. 18, 1931) — Toguramura (F. MAEKAWA, Oct. 27, 1934, no. 8505) — Saigôyama, Sibuya (J. IWATA, Oct. 19, 1935); Prov. Suô : Ôutimura (J. NIKAI, Jul. 30, 1897); Prov. Bittyû : Sayodani (Z. YOSHINO, Aug. 16, 1929); Prov. Musasi : Mt. Siroyama (K. HISAUCHI & T. SATOW, Nov. 17, 1935). *Sikoku :* Prov. Tosa : Mt. Hônokawayama (S. YANO, Aug. 17, 1889). *Kyûsyû :* Prov. Iki : Asibe (K. OHKI, Aug. 13, 1925). *Korea :* Ins. Quelpært : Hongno (T. NAKAI, Mai. 19, 1913, no. 157) — circa Kannonzi (T. NAKAI, Oct. 30, 1917, no. 6154); Prov. Keisyônandô : Ins. Kyosaitô, Mt. Gyokuzyohô (T. NAKAI, Mai. 5, 1928, no. 11094); Prov. Kôkaidô : Ins. Taiseitô (T. NAKAI, Jul. 26, 1929, no. 12680).

Distr. China.

Fig. 54. A leaf of *Bœhmeria platanifolia* FRANCHET & SAVATIER drawn from the type specimen by Professor T. NAKAI. a is hairs on the upper surface, and b is hairs on the veins of the under surface of the leaf. $\times \frac{2}{3}$; a-b, magnified.

40) **Bœhmeria platanifolia** FRANCHET & SAVATIER (Fig. 4-E; Fig. 54), Enum. Pl. Jap. I. p. 440 (1875) — FRANCHET, Pl. David. I. p. 270 (1884) — C. H. WRIGHT in Journ. Linn. Soc. XXVI. p. 486 (1899) — MATSUMURA, Ind. Pl. Jap. II.-2, p. 42 (1912) — MORI, Enum. Pl. Corea, p. 125 (1922) — HANDEL-MAZZETTI, Symb. Sin. VII. p. 151 (1929) — MASAMUNE in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. XI. Bot. no. 4, p. 158 (1934).

Bœhmeria longispica var. *platanifolia* FRANCHET & SAVATIER, l. c. II. p. 497 (1879).

Bœhmeria holosericea (non Blume) Nakai, Fl. Korea. II. p. 198 (1911).

Bœhmeria japonica var. *platanifolia* Maximowicz apud Makino & Nemoto, Fl. Jap. p. 1063 (1925) et ed. 2, p. 223 (1931).

Nom. Jap. *Me-yabumao, Yamaso.*

Hab. *Hokkaidô:* (ex Yamamoto & Tsukamoto). *Honsyû:* Prov. Musasi: Mt. Kariyose (T. Nakai, Sept. 1929) — Sakai (F. Maekawa, Jun. 7, 1931) — Mt. Siroyama (T. Satow, 1934, nos. 2132, 2136) — ibid. (K. Hisauchi & T. Satow, Nov. 17, 1935) — prope Urawa (Y. Satake, Oct. 20, 1935, nos. 3597–3598); Prov. Hitati (J. Matsumura); Prov. Simotuke: Mt. Kogasiyama (T. Nakai, Aug. 7, 1931) — Nikkô (H. Itô, 1931); Prov. Tôtômi: prope Inui (Y. Satake, Aug. 29, 1935, nos. 35101–35103); Prov. Sagami: Manazura (Y. Satake, Oct. 16, 1935, nos. 3599, 35100). *Kyûsyû:* (ex Mayebara & Masamune). *Korea:* Prov. Keisyôhokudô: Mt. Tyôreizan (T. Uchiyama, Oct. 2, 1902); Prov. Zenranandô: Ins. Kyobuntô (T. Nakai, Mai. 24, 1928, no. 11102); Prov. Kôkaidô: Tyôzankwan (T. Nakai, Aug. 5, 1929, no. 12678) — Ins. Taiseitô (T. Nakai, Jul. 26, 1929, no. 12679); Ins. Quelpært (T. Nakai, Oct. 31, 1917, no. 6155).

Distr. China.

The appended table gives the distribution of the Japanese *Bœhmeria* in each region of Japan and in neighbouring countries, such as Manchuria, China, the Philippines, etc.

Species \ Districts	Saghalien	Kuriles	Hokkaidô	Korea	Honsyû	Sikoku	Kyûsyû	Ryûkyû	Bonins	Formosa	Manchuria	China	Philippines	Indo-China	Java	Malay Penin.
B. utilis					C					C		C	C		C	C
B. nivea				+	+							+	+	+	+	+
f. *grosseserrata*					+											
B. frutescens				+	+	+	+			+		+				
var. *concolor*					+		+			+		+				
var. *viridula*										+						
B. densiflora								+		+		+	+			
B. boninensis									+							
B. tricuspis			+	+	+		+					?				
f. *viridipes*					+											

Species \ Districts	Saghalien	Kuriles	Hokkaidô	Korea	Honsyû	Sikoku	Kyûsyû	Ryûkyû	Bonins	Formosa	Manchuria	China	Philippines	Indo-China	Java	Malay Penin.
B. spicata				+	+	+	+				+	+				
var. *microphylla*					+											
B. paraspicata			+	+	+	+					+	+				
f. *viridis*					+											
B. Zollingeriana										+		+	+		+	
B. egregia					+											
B. formosana							+	+		+		+				
B. Sieboldiana				+	+	+	+									
B. pseudo-Sieboldiana							+									
B. Nakaiana				+												
B. Taquetii				+												
B. hirtella				+												
B. biloba			+		+											
B. pilosiuscula										+		+			+	
B. kiyozumensis					+											
B. arenicola					+											
var. *awana*					+											
B. tenuifolia					+											
f. *conferta*					+											
var. *nigricans*					+											
B. minor					+											
B. tiliifolia					+											
B. kiusiana							+									
B. pannosa				+	+		+									
B. gigantea					+											
B. grandissima						+										
B. hispidula					+											

Species \ Districts	Saghalien	Kuriles	Hokkaidô	Korea	Honsyû	Sikoku	Kyûsyû	Ryûkyû	Bonins	Formosa	Manchuria	China	Philippines	Indo-China	Java	Malay Penin.
B. quelpærtensis				+												
f. *glabra*				+												
B. villigera					+											
B. præstabilis					+											
B. Maximowiczii					+	+	+					+				
B. pachystachya					+											
B. taiwaniana										+						
B. robusta					+											
B. dura					+											
B. holosericea					+		+					+		+		
B. izuosimensis					+											
B. longispica			+	+	+	+	+					+				
B. platanifolia			+	+	+		+					+				

C: Cultivated.

INDEX
of
Adopted Names and Synonyms

(Synonyms in *Italics*)

INDEX
of
Japanese Names

JOURNAL OF THE FACULTY OF SCIENCE
IMPERIAL UNIVERSITY OF TOKYO

SECTION I. MATHEMATICS, ASTRONOMY, PHYSICS, CHEMISTRY
SECTION II. GEOLOGY, MINERALOGY, GEOGRAPHY, SEISMOLOGY
SECTION III. BOTANY

Vol. I, Completed (1925–1928).

„ Part 1. Y. Yoshii, Über die Reifungsvorgänge des Pharbitis-Samens mit besonderer Rücksicht auf die Keimungsfähigkeit des unreifen Samens. Price ¥ 2.65

„ Part 2. Y. Ogura, Comparative Anatomy of Japanese Cyatheaceae. Price ¥ 3.80

„ Part 3. Y. Ogura, On the Structure and Affinities of Some Fossil Tree-Ferns from Japan. Price ¥ 1.30

„ Part 4. K. Yasui, Studies on the Structure of Lignite, Brown Coal, and Bituminous Coal in Japan. Price ¥ 2.70

Vol. II, Completed (1927–1932).

„ Part 1. G. Yamaha, Experimentelle zytologische Beiträge. I. Mitteilung. Orientierungsversuche an den Wurzelspitzen einiger Pflanzen. Price ¥ 4.60

„ Part 2. G. Yamaha, Experimentelle zytologische Beiträge. II. Mitteilung. Über die Wirkung des destillierten Wassers auf die Wurzelspitzenzellen von *Vicia Faba* bei verschiedenen Temperaturen. Price ¥ 1.60

„ Part 3. M. Kumazawa, Studies on the Structure of Japanese Species of *Ranunculus*. Price ¥ 1.00

„ Part 4. M. Kumazawa, Morphology and Biology of *Glaucidium palmatum* Sieb. et Zucc. with Notes on Affinities to the Allied Genera *Hydrastis*, *Podophyllum* and *Diphylleia*. Price ¥ 0.60

„ Part 5. Y. Ogura, On the Structure and Affinities of Some Cretaceous Plants from Hokkaido. Price ¥ 0.80

„ Part 6. M. Kumazawa, Morphological Studies of *Anemonopsis*, *Actaea* and *Cimicifuga*. Price ¥ 0.70

„ Part 7. Y. Ogura, On the Structure and Affinities of Some Cretaceous Plants from Hokkaido. Second Contribution. Price ¥ 0.70

Vol. III, Completed (1930–1931).

„ Part 1. M. Honda, Monographia Poacearum Japonicarum, Bambusoideis exclusis. Price ¥ 7.00

„ Part 2. Y. Satake, Systematic and Anatomical Studies on Some Japanese Plants, I. Price ¥ 0.50

Vol. IV, Completed (1932–1936).

„ Part 1. K. Ohki, On the Systematic Importance of Spodograms in the Leaves of the Japanese Bambusaceae. Price ¥ 1.70

„ Part 2. Y. Satake, Systematic and Anatomical Studies on Some Japanese Plants, II. (JUNCACEAE). Price ¥ 1.80

„ Part 3. S. Watari, Anatomical Studies on Some Leguminous Leaves, with Special Reference to the Vascular System in Petioles and Rachises. Price ¥ 2.90

„ Part 4. T. Miduno, Zytologische Untersuchungen der Bryophyten, I. Die Morphologie der Spermatozoiden einiger Hepaticeen.

A. Yuasa, Studies in the Cytology of Pteridophyta, V. Spermatoteleosis in *Notogramme japonica* PRESL and *Pteris multifida* POIRET with special reference to the development of border-brim, lateral bar and cilia-bearing band. Price ¥ 0.90

„ Part 5. K. Kiyohara, Zur SCHIMPER-MEYERschen Theorie der Vermehrung der Chloroplasten. Price ¥ 2.40

„ Part 6. Y. Satake, Boehmeria Japonica. Price ¥ 2.10

SECTION IV. ZOOLOGY
SECTION V. ANTHROPOLOGY

CONTENTS

This JOURNAL is on sale at

MARUZEN CO., LTD.
6, Nihonbashi Tori-Nichome, Tokyo

R. FRIEDLÄNDER & SOHN
Karlstr. 11, Berlin, N. W. 6

Price in Tokyo: Yen 2.10 for this Part

昭和十一年七月二十日印刷
昭和十一年七月二十五日發行

編纂兼發行者
東京帝國大學

印刷者 秋本宗市
東京市麹町區内幸町一丁目四番地

印刷所 株式會社ヘラルド社印刷部
東京市麹町區内幸町一丁目四番地

賣捌所 丸善株式會社
東京市日本橋區通二丁目六番地